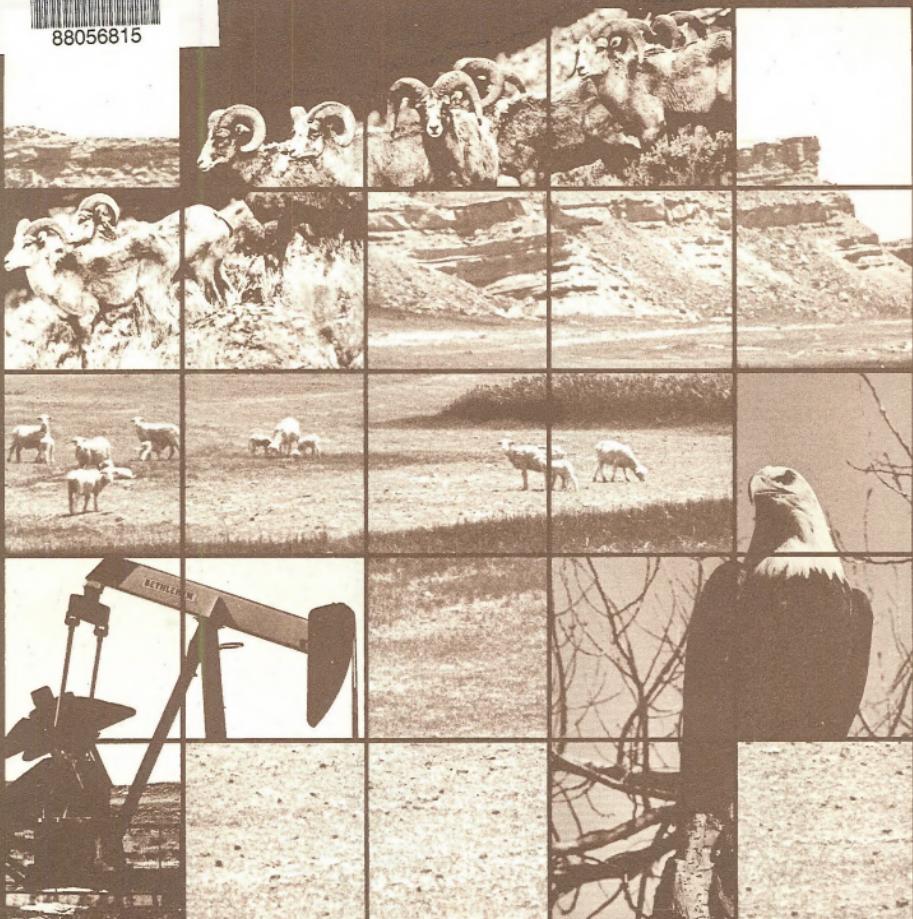


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BUFFALO

Resource Management Plan
Draft Environmental Impact Statement

**SECOND DRAFT RESOURCE MANAGEMENT PLAN
AND
ENVIRONMENTAL IMPACT STATEMENT
FOR THE BUFFALO RESOURCE AREA
CASPER DISTRICT, WYOMING**

Lead Agency: U.S. Department of the Interior, Bureau of Land Management

Type of Action: Administrative

Jurisdiction: Campbell, Johnson, and Sheridan counties, Wyoming

Abstract: This document presents four alternative resource management plans for the Buffalo Resource Area and addresses the environmental consequences of each alternative. The major planning issues relate to coal, grazing management, and wilderness. The alternatives present a variety of combinations of proposals relating to areawide and site-specific issues. The "no action" alternative would continue the present management. The other alternatives represent a range of choices from favoring economic production to favoring environmental protection.

A 90-day comment period is provided for public review of this draft document. Comments, which will be accepted until November 23, 1984, should be sent to the following address:

Glenn Bessinger, Area Manager
Bureau of Land Management
300 Spruce Street
Buffalo, Wyoming 82834
(307) 684-5586

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August 1984

Dear Reader,

A Draft Resource Management Plan and Environmental Impact Statement (RMP/EIS) was issued for the Buffalo Resource Area in April 1983. Many of the comments received on that document indicated that more detail was needed so that the reader could better understand the alternatives and consequences presented. Primarily for that reason, we are issuing a second, more comprehensive draft. This draft includes more detailed information and analysis and addresses public comments received on the first draft.

This document will guide management of the Buffalo Resource Area for ten years. Your comments are important. Please review the draft carefully and give us your comments either in writing or orally.

Written comments should be sent to Glenn Bessinger, Area Manager, 300 Spruce Street, Buffalo, Wyoming 82834. They must be received by November 23, 1984. Oral and written comments may be made at the public hearing scheduled for September 26, 1984, at 7 p.m. in the Guaranty Federal Bank, 412 N. Main, Buffalo, Wyoming.

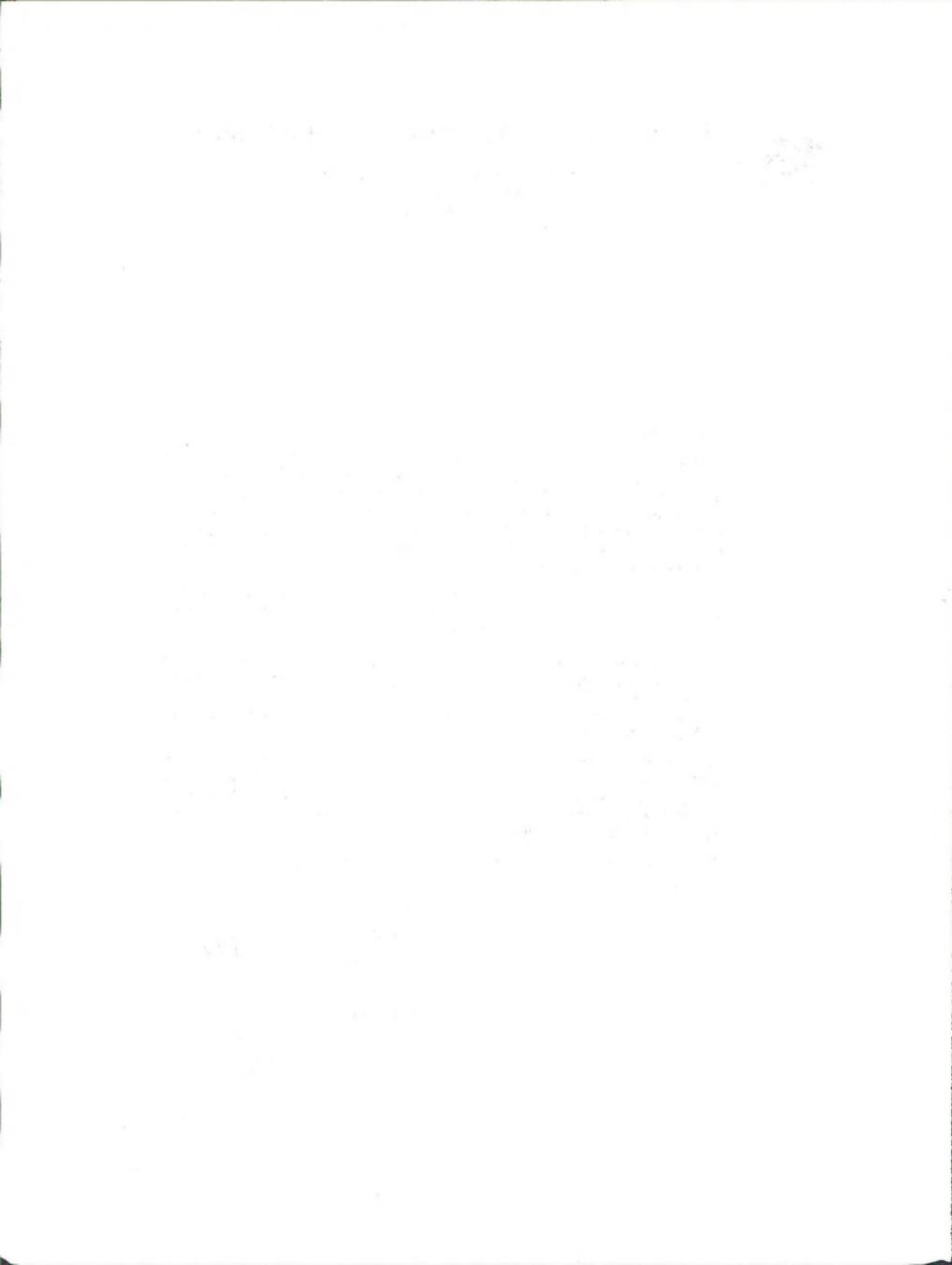
All written comments received during the 90-day comment period and all written and oral comments from the public hearing that pertain to the adequacy of the document will be addressed in the final RMP/EIS, which is scheduled for completion in April 1985. You should retain this draft document, as portions of it may not be reprinted in the final.

Thank you for participating in this planning process. We appreciate your time and comments.

Sincerely,

State Director

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SECOND DRAFT RESOURCE MANAGEMENT PLAN
AND
DRAFT ENVIRONMENTAL IMPACT STATEMENT
for the
BUFFALO RESOURCE AREA
CASPER DISTRICT, WYOMING

Prepared By

Bureau of Land Management
Buffalo Resource Area
and
Casper District Office
Wyoming
August 1984

Hillary A. Oden

State Director, Wyoming State Office



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ABBREVIATIONS

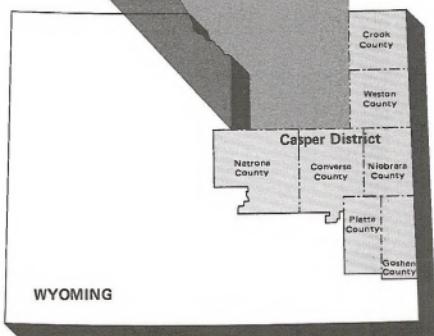
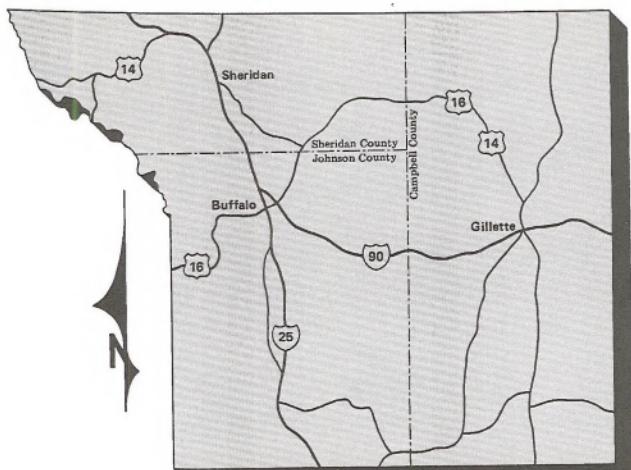
[Note: Many of these terms are further defined in the Glossary.]

ACEC	Area of critical environmental concern
AMP	Allotment management plan
APD	Application for permit to drill
APHIS	Animal and Plant Health Inspection Service, U.S. Department of Agriculture
AUM	Animal unit month
AVF	Alluvial valley floor
BLM	Bureau of Land Management, U.S. Department of the Interior
B.P.	Before present
Btu	British thermal unit
"C" allotments	See appendix 3
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations. Numbers refer to title and part; that is, 40 CFR 1500 refers to title 40, part 1500.
CRMP	Cultural resource management plan
DEQ	Department of Environmental Quality, Wyoming
EA	Environmental assessment
EIS	Environmental impact statement
EPA	U.S. Environmental Protection Agency
FCLAA	Federal Coal Leasing Amendments Act of 1976
FLPMA	Federal Land Policy and Management Act of 1976
FS	Forest Service, U.S. Department of Agriculture
gpm	Gallons per minute
GS	Geological Survey, U.S. Department of the Interior
HMP	Habitat management plan
"I" allotments	See appendix 3
KGS	Known geologic structure
"M" allotments	See appendix 3
MBF	Thousand board feet
mcf	Thousand cubic feet
MFP	Management framework plan
mg/l	Milligrams per liter
MMBF	Million board feet
MRB	Missouri River Basin
NAAQS	National ambient air quality standards

Abbreviations

NEPA	National Environmental Policy Act of 1969
NRDC	Natural Resources Defense Council
NWPS	National Wilderness Preservation System
ORV	Off-road vehicle
PRIA	Public Rangelands Improvement Act of 1978
PRLA	Preference right lease application
PSD	Prevention of significant deterioration
R&PP	Recreation and public purposes
RMP	Resource management plan
ROD	Record of decision
SCS	Soil Conservation Service, U.S. Department of Agriculture
SHPO	State Historic Preservation Officer
SMCRA	Surface Mining Control and Reclamation Act of 1977
SS	Suspended solids
T&E	Threatened and endangered species
TDS	Total dissolved solids
TSP	Total suspended particulates
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFWS	U.S. Fish and Wildlife Service
VRM	Visual resource management
WGFD	Wyoming Game and Fish Department
WSA	Wilderness study area
WSR	Wilderness study report





General Location
Buffalo Resource Area

WYOMING



SUMMARY

INTRODUCTION

This draft resource management plan/environmental impact statement (RMP/EIS) was prepared in accordance with the BLM planning regulations in 43 CFR 1600 and the National Environmental Policy Act (NEPA). The NEPA regulations appear in 40 CFR 1500. These regulations were developed in response to the Federal Land Policy and Management Act of 1976 (FLPMA). The plan addresses the proposed land use management alternatives on BLM-administered public lands and resources in the Buffalo Resource Area.

The Buffalo Resource Area encompasses all BLM-administered public lands in Johnson, Sheridan, and Campbell counties, Wyoming. The area considered comprises 7,338,800 acres, of which 798,848 acres (11%) is BLM-administered public surface and 4,733,384 acres is federal mineral estate. The resource area is shown on the Location map in the front of this document.

PUBLIC INVOLVEMENT

The public was invited to participate in the identification of issues through notices in the *Federal Register* and local media. Small group meetings also were held. Issues were identified in the following programs: cultural resource management, fire management, forest management, grazing management, lands and realty, minerals management, recreation management, wilderness, and wildlife habitat management.

THE ALTERNATIVES

Four alternative resource management plans are described and analyzed. Each plan represents achievable and reasonable management levels.

Alternative A, the "no action" alternative, would continue the present management direction. The basis for this alternative is existing land use decisions from management framework plans (MFPs), activity plans, and environmental assessments (EAs) prepared in the Buffalo Resource Area.

Alternative B would balance competing demands by providing for the production of needed goods and services while protecting important and sensi-

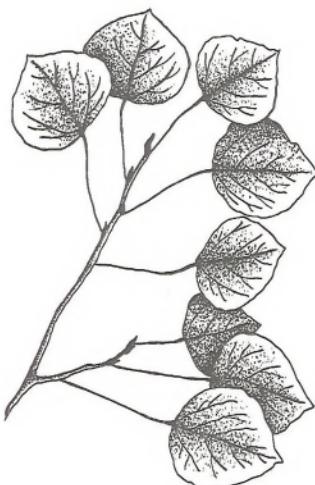
tive environmental values. It would address identified issues in a balanced, cost-effective manner.

Alternative C would provide for protection of environmental values to the extent required by applicable laws, regulations, and policies. The objective of this alternative is to address identified issues in a manner generally favoring economic production.

Alternative D would place primary emphasis on environmental protection. The objective of this alternative is to change present management direction to address the identified issues in a manner that generally would place highest priority on the maintenance or improvement of environmental quality.

The preferred alternative is Alternative B, which would provide an optimum level of production while protecting the environment. This alternative best responds to the issues in a multiple use framework. It emphasizes the management, production, and use of the renewable resources on the public lands in the resource area while making available the nonrenewable energy resources for continued development and use.

The environmental consequences of implementing each alternative are summarized on table 2-4 at the end of chapter 2.

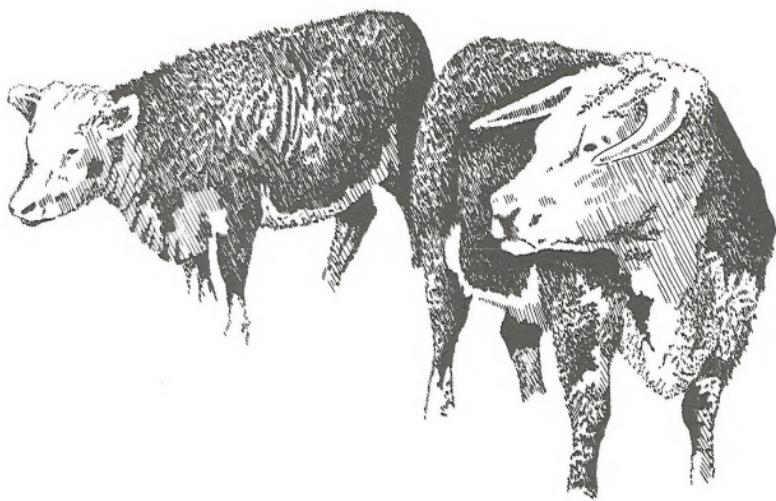




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Chapter One

Purpose of and Need for the Action; Issues and Criteria



PURPOSE OF AND NEED FOR THE ACTION

PURPOSE

A resource management plan is needed to provide general guidance for management of lands and minerals administered by the Buffalo Resource Area, Bureau of Land Management (BLM) in Campbell, Johnson, and Sheridan counties, Wyoming. This draft RMP represents four alternatives for management direction for the resources of the public lands in the resource area. The environmental impact statement (EIS), which analyzes the effects of implementing the different plan alternatives, will aid decisionmakers in selecting a plan for managing the resource area's lands and minerals for the next ten years.

After a public comment period, a final RMP will be prepared to present a proposed resource management plan. The RMP will be based on current information, sound criteria, and public input.

A record of decision to be prepared after a 30-day protest period will identify the plan selected. The final plan identified in the record of decision will provide the basis for resource allocation and define and guide management decisions. It is not intended to make program decisions for individual resource elements; rather, it will provide overall multiple use objectives and management direction for the resource area. Resource use will be managed within the principles of multiple use and sustained yield.



Purpose & Need; Issues & Criteria

OBJECTIVES

The objectives of this document are outlined below.

To revise, replace and consolidate into one document the planning decisions from numerous existing plans, amendments, and resource-specific environmental assessments.

To analyze alternatives for livestock grazing management on public land as required under current mandates resulting from a 1975 court order that followed a lawsuit filed against the BLM by the Natural Resources Defense Council.

To analyze the suitability of lands for wilderness, development of coal or oil and gas, intensive grazing management, and land disposal.

To identify areas for limited, restricted, or exclusive use, and to identify allowable resource use and related levels of use or production.

To enable the public to participate in managing their public land resources.

To address issues identified through the planning process.

To guide the development of detailed site-specific activity plans when needed.

AUTHORITIES

The BLM's principal authority to manage public land is established by the Federal Land Policy and Management Act of 1976 (FLPMA). Through this authority, the BLM is responsible for managing resources on public lands in a manner that maintains or improves them.

The BLM planning regulations are set forth in 43 CFR 1800. Preparation of EISs is guided by the regulations of the Council on Environmental Quality (CEQ) (43 CFR 1500). Program-specific guidelines are provided by the Public Range-lands Improvement Act of 1978 (PRIA), the Federal Coal Leasing Amendments Act of 1976 (FCLAA), the Surface Mining Control and Reclamation Act of 1977 (SMCRA), and the Endangered Species Act of 1973 (as amended), among others.

THE PLANNING PROCESS

The planning process described in the BLM planning regulations has been followed in preparation of this plan. It consists of the following nine action steps.

Step 1: Identification of Issues (scoping)

Step 1 is intended to identify resource management problems, conflicts, or opportunities that can be resolved through the planning process. For this planning effort, BLM personnel reviewed existing planning documents during the issue identification step. Decisions that conflicted with existing policies, laws, or regulations or had been completed or implemented were dropped. Decisions that emphasized standard operating procedures were not continued as part of the "no action" alternative, but the procedures will be complied with as a matter of policy.

The public was invited to participate in the identification of issues and the entire planning process through notices in the *Federal Register* and local media and in informal small groups or individual meetings. All grazing lessees and prior respondents to the wilderness inventory analysis were contacted by letter or in person, as were commissioners of each county in the resource area. Other interested or affected individuals, agencies, and organizations also were contacted.

Step 2: Development of Planning Criteria

Step 2 involves development of planning criteria to establish guidelines for developing alternatives to address each issue. Planning criteria established for specific planning issues are listed in the "Issues and Planning Criteria" section of this chapter.

The following general criteria were established at the outset of the planning process to guide the development of alternatives and the analysis of environmental impacts:

Purpose & Need; Issues & Criteria

Each issue would be addressed in a manner that would conform with existing law, policy, and regulations. At a minimum, range and wilderness issues would be addressed in the RMP.

Existing valid land use decisions from management framework plans, activity plans, plan amendments, and environmental assessments would be included in the RMP under the "no action" alternative, which would continue present management.

All alternatives formulated in the RMP would be reasonable and achievable and would address the issues.

Step 3: Collection of Inventory Data

Inventory data are collected during step 3. Data input for the RMP consisted of existing available information, including the physical data compiled in previous land use plans for the Buffalo Resource Area, and other available information.

Step 4: Analysis of the Management Situation

Step 4 calls for an analysis of the management situation to determine the capability of the resources to respond to the issues.

Step 5: Formulation of Alternatives

During step 5, alternatives were developed to respond to the issues identified during the issue identification process. The alternatives were based on the information from the analysis of the management situation (step 4). The alternatives explore a reasonable range of possible resolutions to issues, from favoring economic production to favoring environmental protection.

Step 6: Estimation of Effects of Alternatives

In step 6, the physical, biological, and socio-economic consequences of implementing each alternative were addressed. The decisions in each alternative were assessed individually and cumulatively to determine what effects their implementation would have on the environment. The analysis is discussed in detail in chapter 4.

Step 7: Selection of the Preferred Alternative

Step 7 calls for selecting the preferred alternative. Alternative B was selected because (a) it best addresses the issues, (b) it is most acceptable in terms of consequences, (c) it has the most favorable balance of resource uses, and (d) it is most responsive to comments from the public and from other agencies.

Step 8: Selection of the Resource Management Plan

During step 8, selection of the resource management plan, public comments on this draft RMP/EIS will be evaluated, and a proposed RMP/final EIS will be published. A final RMP will be identified in a record of decision (ROD) that will be published following a 30-day comment period after the final EIS appears.

A rangeland program summary will be issued either with the record of decision or not later than five months after the ROD. The rangeland program summary will summarize the grazing management action for the resource area.

After the 90-day review and comment period for this draft RMP/EIS, a wilderness study report (WSR) and a separate final EIS will be prepared for all wilderness study areas (WSAs) in the Buffalo Resource Area. The WSR will present to the Secretary of the Interior the BLM's recommendation as to whether or not each WSA should be designated wilderness. The Secretary of the Interior will then make his recommendations on wilderness designation to the President, who in turn makes his recommendation to Congress. The Congress will make the final decision as to designation or nondesignation of each WSA.

Step 9: Monitoring and Evaluation

Step 9 involves monitoring the selected plan and evaluating its results. The Buffalo Resource Area plan will be monitored and evaluated for management effectiveness and for its ability to meet public needs and demands, BLM policy, and stated objectives. Should monitoring reveal that changes in the plan are necessary, they can be achieved through plan maintenance (administrative modification), amendments to specific parts of the plan, or a new RMP/EIS.

ISSUES AND CRITERIA

IDENTIFICATION OF ISSUES

The focus of this draft RMP is to address planning issues. An issue is a concern, need, problem, conflict, or opportunity related to the use or management of public lands and resources.

Issues for this plan were derived from public input, an intensive review of existing planning documents, suggestions from interdisciplinary team members, and BLM policy and management. Not all issues raised are addressed in this document. Some had already been addressed in environmental assessments; others are beyond the jurisdiction of the BLM. Still other issues are in the "administrative" category; that is, they do not require an environmental analysis but may instead require changes in legislation, policy, or program priority. Appendix 1 summarizes the suggested issues and indicates those addressed in this document.

To be identified as a planning issue for analysis in this document, a proposed issue had to meet one or more of the following criteria:

It could not be resolved by administrative action.

It was of considerable concern to the public, to another agency, or to BLM management.

It did not have to be resolved before the RMP was completed.

MAJOR ISSUES AND PLANNING CRITERIA

This section describes the major issues dealt with in this RMP/EIS and the planning criteria that were developed for each issue. They are presented by resource program.

Cultural Resource Management

Issues

Protection of identified cultural resource values needs to be increased for the scientific or socio-cultural benefit of present and future generations.

Increased activity in various land uses leads to an increased need for more intensive management to protect cultural resources. Significant cultural sites are being adversely affected, and there is potential for permanent loss.

Intensive management direction and protection are needed for specific cultural sites. Management direction and protection are needed for Cantonment Reno, Dull Knife Battlefield, and the Outlaw Cave Archeological District.

Cultural sites could be damaged by surface-disturbing activities. New information indicates a high potential for significant cultural sites to be encountered on public surface during surface-disturbing activities in the following areas: Gardner Mountain (Ts 43-45N, R85W), Fortification Creek (Ts 51-53N, Rs 75-77W), Middle Fork (Ts 41-43N, Rs 83-85W), Pumpkin Buttes (Ts 51-53N, Rs 75-77W), and Rochelle Hills (Ts 45-47N, Rs 69-70W). Inadvertent contact with a cultural site during development could damage the cultural resources by destroying the horizontal or vertical context, or both.

Planning Criteria

Specific values that may be lost or compromised must be identified, and the way in which subsequent effects and site changes occur must be defined.

Priority will be assigned to cultural sites in order of significance; and options to preserve, protect, enhance, or salvage these sites will be defined.

Evaluation of the significance of cultural resources will be based upon National Register of Historic Places criteria set forth in 36 CFR 60.4, Advisory Council on Historic Preservation regulations (36 CFR 800), and BLM cultural resource regulations (43 CFR 8100). Assessment of impacts will be based on 36 CFR 800.3, "Criteria of Effect and Adverse Effect."

In areas identified as having high cultural site density, an alternative will be considered that would allow geophysical exploration while protecting cultural resource values (in line with policy specified in BLM Manual Supplement 8143, Appendix IV).

Purpose & Need; Issues & Criteria



Courtesy of Wyoming State Archives and Historical Department

Fire Management

Issues

The cost of fire suppression should reflect the value of the resources being protected. Current planning gives little direction to fire management as it relates to the resource values. Full fire suppression is not needed in the entire resource area.

Prescribed burning should be used to support the forestry, grazing management, and wildlife programs.

Planning Criteria

Limited suppression will be considered only in Class I and Class II value-at-risk areas. (Value-at-risk classes are defined in the Glossary.) Full

suppression will be maintained in each proposed limited suppression area until a fire management plan and an environmental assessment (EA) have been completed.

Prescribed fire will be considered as described for the following programs:

Vegetation manipulation may be used in range management to convert brush to desired species, rejuvenate desired species, increase forage production, prevent or retard encroachment by trees, increase nutrient value and palatability, or maintain condition.

Fire will be used for disposal of forest product residues and for forest management practices such as seedbed preparation, hazard reduction, control of disease or insects, thinning, or species manipulation.

Purpose & Need; Issues & Criteria

Fire may be used to achieve diversity of wildlife habitat, to establish a mosaic pattern, to accomplish vegetation manipulation such as aspen sprouting or brush conversion, or to set back succession.

Livestock grazing on commercial forestlands is impairing the productive capacity of certain forest sites. Livestock can affect commercial forestlands by browsing and trampling of young trees and by compacting the forest soils.

Forest Management

Issues

Greater flexibility is needed in scheduling proposed timber sales. Under current planning decisions, a timber sale schedule has been prepared that lists the year in which each sale is to be offered. This does not permit flexibility in scheduling the sales. Problems in acquiring easements, effects on big game, and fluctuations in market conditions could be dealt with more effectively if timber sales could be rescheduled when necessary.

Sales of forest products from woodlands should be permitted. Under current planning decisions, sales of forest products from woodlands are not allowed unless they are needed to control insect or disease infestations. A continued increase in the demand for forest products is projected for the next ten years. Sales of forest products from the woodlands would help meet the increased demand.

Planning Criteria

Removal of specific schedules for individual timber sales will be considered. The basic provisions of the original sales may need to be modified to meet changing economic and biological conditions.

Sales of wood products will not disrupt wildlife habitat.

Management of commercial forestlands will be incorporated into allotment management plans (AMPs) as they are developed.

Grazing Management

Issues

Conflicts exist between livestock grazing and wildlife forage demand. The wildlife population in 23 "I" (improve) category allotments does not meet the objectives of the Wyoming Game and Fish Department (WGFD), which would require an additional 2,400 AUMs of forage.

Rangeland is in less than good condition. Data from various surveys indicate that range condition in portions of the 29 "I" allotments is poor to fair. Opportunities have been identified for improving resource production and management on these allotments.

Planning Criteria

Existing resource data will be used in the evaluation of allotments.

For the purpose of evaluation and development of grazing alternatives, it is assumed that livestock use is a primary factor in keeping big game populations below the management objective levels of the WGFD. Other factors could be excessive hunting pressure, mineral development, other development, recreational activities such as off-road vehicle (ORV) use, or game emigration caused by severe winters.



Purpose & Need; Issues & Criteria

Range condition issues on the "I" allotments will be addressed through application of intensive livestock grazing management and through construction of range improvements as outlined in AMPs.

Analyses will be conducted to determine whether possible reductions in livestock use would improve range condition and reduce competition between livestock and big game.

Lands and Realty

Issue

The efficiency of public land management needs to be improved. The scattered and complex pattern of public land makes management difficult and uneconomical. Improved efficiency and quality of public land management could enhance public use of this land. Many small, isolated, scattered tracts are without legal access. This limits or precludes public use of many parcels. Disposal of isolated small tracts would increase management efficiency.

Planning Criteria

The disposal of public lands in the resource area will be consistent with the disposal criteria listed in section 203 of FLPMA. A tract meets the disposal criteria if (a) it is difficult and uneconomic for the BLM to manage and it not suitable for management by another federal agency; (b) it is no longer needed for the purpose for which it was acquired or for any other federal purpose; and (c) its disposal would serve important public objectives such as expansion of communities and economic development.

Disposal of public land within the given grazing lease should not be considered unless all the public land in that lease can be disposed of. Exchange should not be considered unless the private land available for exchange adjoins other public land.

Minerals Management

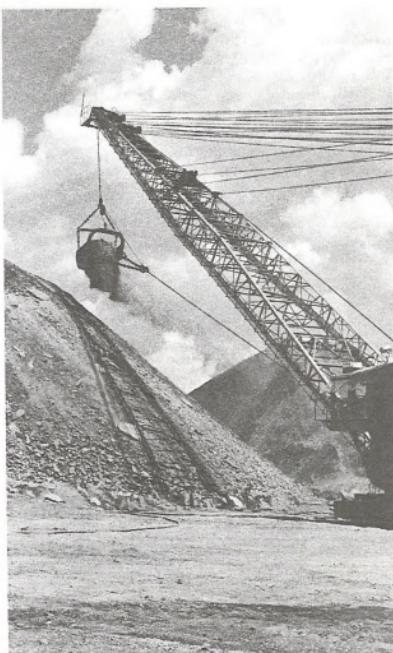
Coal Issue

Current coal planning is not in accordance with current regulations. Only coal areas with high and moderate development potential coal were reviewed in past planning efforts. New regulations

direct planning to all coal areas that have developmental potential and in which industry has expressed interest.

Planning Criteria

The resource area will follow the coal screening process as described in 43 CFR 3420. This includes the following steps: (1) call for coal resource information, (2) assessment of coal development potential, (3) application of the coal unsuitability criteria, (4) analysis of multiple-use conflicts, and (5) surface owner consultation. (Appendix 2 contains a detailed description of the coal screening process and its application in the Buffalo Resource Area.)



Purpose & Need; Issues & Criteria

Recreation Management

Issue

Off-road vehicle designations are needed for Campbell and Sheridan counties. Executive Orders 11644 and 11989 directed that all public land be analyzed and designated with respect to the use of ORVs. An ORV environmental assessment and plan has been completed for Johnson County.

Planning Criteria

ORV designation must follow the procedures in and be in accordance with 43 CFR 8341.

Wilderness

Issue

Recommendations must be made on the three wilderness study areas in the Buffalo Resource Area. Section 603 of FLPMA directs the Secretary of the Interior to have the BLM inventory and study all public lands under its jurisdiction for their wilderness potential and make recommendations regarding their suitability for wilderness designation.

Planning Criteria

The suitability or nonsuitability of the WSAs for wilderness designation will be determined according to the criteria contained in the BLM's wilderness study policy (*Federal Register* 47:5098-5122).

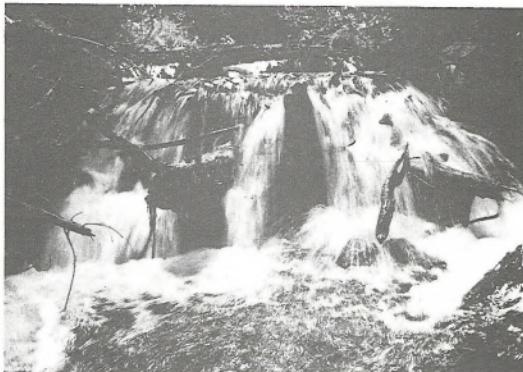
Wildlife Habitat Management

Issue

Priorities need to be assigned for preparation of habitat management plans. An existing planning decision states that habitat management plans (HMPs) should be prepared to improve and protect waterfowl habitat on 62 reservoirs. Priorities should be assigned according to the management needs and capabilities of areas with habitat management potential. HMPs should then be prepared accordingly.

Planning Criteria

Areas with good potential for habitat management should have high priority in preparation of the HMPs. (Examples are large areas of public land or areas that contain important wildlife habitat.)



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Chapter Two

The Alternatives



FORMULATION OF ALTERNATIVES

OVERVIEW

Both the regulations of the National Environmental Policy Act (NEPA) and the BLM resource management planning regulations require the formulation of alternatives. Each alternative in this document represents a complete and reasonable plan to guide future management of public land and resources. One alternative represents "no action." As defined in the planning regulations (43 CFR 1610.4-5), no action means a continuation of present levels or systems of resource use. The other alternatives in this document provide a range of choices from economic production to environmental protection.

The basic goal in formulating alternatives for this RMP was to identify combinations of public land uses and resource management practices that address the issues. Alternatives were first formulated for each issue on the basis of the individual resource programs. These program alternatives were then combined to produce alternatives for the entire resource area. Each of the resulting areawide alternatives covers all BLM resource programs in the resource area.

The alternatives in this RMP are consistent with plans of other federal agencies and with state and local plans. Chapter 5 contains a more detailed discussion of consistency.

CRITERIA USED IN FORMULATION OF ALTERNATIVES

Parameters

The criteria outlined in this section were used as parameters for the RMP alternatives discussed in this document.

Each alternative will be a complete resource management plan.

Each alternative will address each identified issue.

Each alternative will include the planning decisions to be continued from existing management, as well as any proposed new decisions formulated to address issues or to make changes from existing management.

Each alternative will be reasonable, implementable, and achievable.

Each alternative will assume consistency and compliance with local, state, and federal laws, regulations, and policies.

Alternatives will be consistent with guidance from the BLM state director, Wyoming, and with program policy statements of the BLM director. This guidance is available for review at the Buffalo Resource Area office.

Each alternative will identify areas with limited, restricted, or exclusive use, if any.

Each alternative will identify areas for which more detailed, site-specific plans are needed.

No alternative will totally exploit any resource or totally eliminate any resource program or activity.

No alternative will eliminate any BLM programs or activities upon which there is local economic dependency.

Alternatives to Be Included

Alternatives will include a no action alternative (defined as a continuation of present levels or systems of resource use—Alternative A), an alternative that favors economic production (C), an alternative that favors environmental resource protection (D), and an alternative that tends to fall between the latter two (B).

Guidelines for Specific Programs

The following guidelines will be followed for the specific programs noted.

Coal

A minimum of three coal alternatives will be considered. A no action alternative would analyze the lands acceptable for further consideration for leasing, as identified in the existing Management Framework Plan, as amended. Two other coal alternatives would analyze various configurations of lands acceptable for further consideration.

Each alternative will contain a total figure for federal coal available for leasing consideration after application of the coal screening process, which is defined in 43 CFR 3420.1-4 (see appendix 2).

Alternatives

Each alternative will address (a) outstanding preference right lease applications, (b) delineated unleased federal coal tracts, and (c) committed federal coal (existing leases).

Each alternative (except for the "no action" alternative) will include a schedule establishing how long the BLM will consider present and future delineated coal tracts for competitive leasing.

Grazing

A minimum of four grazing alternatives will be considered: no action (current situation), no grazing, increased livestock grazing use, and decreased livestock grazing use. A proposed action will be identified. It may be one of the previously mentioned alternatives.

Wilderness

A minimum of three alternatives will be addressed for each WSA: no action, all wilderness, and no wilderness. A proposed action will be identified. It may be one of the previously mentioned alternatives. Partial wilderness for the WSA will be examined where applicable.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

The following alternatives were considered as possible methods of addressing specific issues in the Buffalo Resource Area but were eliminated from detailed study because of technical, legal, or other constraints.

Forest Management

An alternative that would have eliminated livestock grazing from all commercial forestlands was considered but rejected because certain forest types such as ponderosa pine have been determined to be suitable for limited livestock grazing, and because the issue related only to specific areas (about 1,000 acres of the 40,000 acres of BLM-administered commercial forest in the resource area).

Grazing Management

Maximum Forage Production on "I" Allotments

An alternative to maximize forage production was considered. The objective would have been to bring the range on all "I" allotments to excellent condition. This would have been accomplished over the ten-year life of the plan through intensive project development and livestock management. All new AUMs would have gone to livestock production.

This alternative would have included construction of 27 wells, 6 springs, 13 reservoirs, 56 miles of pipeline, 6,800 acres of brush control, and 200 acres of prairie dog control. It was estimated that the improvement in range condition on the "I" allotments would have resulted in an increase of 25,300 AUMs. The AUM increases would have accumulated over 30 years following implementation of 29 AMPs during the ten-year life of the plan.

The benefit/cost ratio of the maximum forage production alternative would not have been positive; therefore, the alternative would have been unreasonable.

Public comments indicated that there is a definite interest in maintaining current levels of forage production, but very few comments indicated an interest in or need for management of the public land to maximize forage production for livestock. In addition, other resource values such as wildlife habitat would have been compromised.

Maximum Forage Production on "M" Allotments

An alternative to increase forage production on "M" allotments was considered. It proposed initiation of intensive grazing management practices on all "M" allotments with a potential for a positive return on public investments.

The alternative was eliminated from detailed study because preliminary benefit/cost analysis indicated that the rate of return on public investment for the "M" allotments would not be favorable. The relatively low rate of return would be expected because there is only limited opportunity for improving productivity on the "M" allotments; these allotments already are producing at or near their potential. In addition, the public land in most of the "M" allotments is less consolidated than that in the "I" allotments; thus, management opportunities are more limited.

Alternatives

Elimination of Livestock Grazing

An alternative to exclude livestock use from all public land in the resource area was addressed. However, it was found to be unreasonable and unfeasible. It was eliminated from detailed study following interdisciplinary analysis during formulation of the planning criteria. The following factors were instrumental in the decision to eliminate the "no grazing" alternative from detailed study.

Given the highly fragmented nature of public land in the resource area (more than half the leases cover less than 640 acres), exclusion of livestock grazing would have required extensive fence construction. It is estimated that 6,000 miles of fence would have been required to implement a "no grazing" alternative. The cost to the public would have been exorbitant not only in expense but also in interference with wildlife movement and disruption of ranching operations.

Elimination of livestock grazing on all allotments would have addressed the range issues of unsatisfactory range condition in certain areas and that of wildlife populations lower than the WGFD objectives. However, this alternative was found to be unreasonable in that it proposed a "blanket" action for site-specific "I" allotment situations. The elimination of grazing on allotments in good condition or on those where wildlife populations were at or above objective levels would not have addressed the overall range issue. The "no grazing" alternative was not supported by the public during issue identification and scoping.

Lands and Realty Management

An alternative was considered that would have prohibited sales or exchanges of lands in the resource area. It was not analyzed further because it would not have resolved the issue as defined and would not have been consistent with policy.

Minerals Management

In consideration of a possible coal alternative, all preference right lease applications (PRLAs) in the resource area were considered for potential exchange. The evaluation revealed that there were no unique resource values in the PRLAs, and there have been no exchange proposals.

Processing of the PRLAs has not progressed to the point that determinations can be made as to whether each applicant is entitled to a lease. Until that point in the process is reached, there is no basis for determining which PRLAs or portions of PRLAs might qualify for exchange. Therefore, there is no reason at this time to give detailed consideration to an alternative that proposes exchanges of federal coal lands in the PRLAs. (PRLAs are discussed in more detail in chapter 3.)

If BLM evaluation of an applicant's final showing results in a determination that a PRLA can be economically developed after environmental effects are mitigated, the applicant is entitled to a coal lease. At that time, should the BLM find that the PRLA should not be developed because of sensitive environmental conditions, an exchange could be negotiated. If an exchange is not consummated for whatever reason, the BLM would develop protective stipulations and continue to process the application in accordance with 43 CFR 3430 procedures.

PRLAs that cannot meet the requirements of the final showing would be rejected.

An alternative was evaluated that proposed confining new federal coal leasing to PRLAs, delineated unleased coal tracts, exchanges, modifications to existing leases, and emergency leasing. The alternative would not have provided the flexibility needed to respond to changes in national policy, in the national energy outlook, or in the economic environment.

Management of WSAs

Certain alternatives were considered as possible methods of resolving specific resource use conflicts in some WSAs. Each would have eliminated part of a WSA from wilderness consideration because of a specific resource. "Conflict resolution" alternatives that were considered but not analyzed in detail are described in the following paragraphs.

A conflict resolution alternative was proposed for Gardner Mountain WSA that would have excluded from wilderness consideration most lands containing timber of commercial value. This would have further reduced the size of the 6,423-acre WSA by approximately 750 acres, creating an irregular configuration and greatly reducing the area for solitude in the WSA. These changes would have resulted in an unmanageable WSA. The 750 acres represents less than 2% of

Alternatives

the BLM-administered commercial forestland in the resource area (40,000 acres) and less than 0.2% of the estimated total commercial forestland, including that administered by the Forest Service, in the three-county area.

A conflict resolution alternative for the North Fork WSA would have removed about 2,450 acres of commercial forestland from the WSA to allow for commercial development of the forestland. The alternative was not analyzed further because development of commercial forestland in the WSA would have impaired wilderness characteristics by reducing opportunities to experience solitude and enjoy primitive recreation. The acreage represents approximately 6% of the BLM-administered commercial forestland in the resource area and less than 1.5% of the estimated total acreage of commercial forestland in the three-county area.

A conflict resolution alternative considered for the Fortification Creek WSA would have changed the WSA boundaries to allow development of three oil and gas leases that are within the WSA. Each lease carries a wilderness stipulation that requires that nonimpairment criteria be met by all surface activities. To meet the nonimpairment criteria, lessees would have to drain the reserves within the WSA boundary by directional drilling and drainage from locations outside the WSA. Since this is a feasible approach to developing the oil and gas resource, there was no reason to redefine the boundaries of the WSA to exclude these leases.

In addition, this alternative would have eliminated 960 acres containing 50 million tons of coal with development potential. However, since approximately 70 billion tons of high-moderate federal coal is currently available for new leasing consideration, the 50 million tons (0.07%) is insignificant.



ALTERNATIVES CONSIDERED IN DETAIL

COMPARISON OF ALTERNATIVES

Environmental consequences that would be expected from implementation of each alternative are discussed in detail in chapter 4. A comparison summary table (2-4) appears at the end of this chapter.

SELECTION OF THE PREFERRED ALTERNATIVE

Each alternative considered in this RMP/EIS represents a comprehensive plan for managing all land and resources in the Buffalo Resource Area. What differentiates one alternative from another is the way each issue would be addressed if that alternative should be selected for implementation.

Guidance for grazing and wilderness EISs state that a "proposed action" must be presented. Planning regulations require that a preferred alternative be identified in the draft RMP/EIS. Throughout this document, then, the proposed action and the preferred alternative will be the same.

The preferred alternative is Alternative B, which would provide an optimum level of production while protecting the environment. This alternative best responds to the issues in a multiple use framework, emphasizing the management, production, and use of the renewable resources on the public lands in the resource area, and making the nonrenewable energy resources available for development and use.

ALTERNATIVE A: THE "NO ACTION" ALTERNATIVE

Introduction

The "no action" alternative would continue the present management direction. The basis for this

alternative is existing land use decisions from management framework plans (MFPs), activity plans, and EAs prepared for the Buffalo Resource Area. Decisions that were duplicated or were not in accordance with current laws, regulations, and policy were dropped. Those that are standard operating procedure were not included in the description of the alternative but will be routinely implemented as a matter of policy. Decisions that came through that screening process are included in this alternative description.

MFPs were completed for the Eastern Powder River Basin (Campbell County) in 1977 and for the Western Powder River Basin (Sheridan and Johnson counties) in 1979. For easier use, these plans were consolidated into one document called the "Buffalo Management Framework Plan" (BMFP).

Four planning amendments to the Buffalo MFP were prepared to address coal planning in the Gillette, Highlight, Western Powder River, and Recluse review areas (USDI, BLM 1980a, 1980i, 1981a, 1982a).

Activity plans have been completed for several planning decisions in the Buffalo MFP. Administrative actions and land uses or developments proposed in these activity plans have been implemented. Other activity plans have been developed at the district or State Office levels to guide present management in the Buffalo Resource Area. Examples are animal damage control plans and plans for control of noxious weeds (USDI, BLM 1983a, 1982b).

All activity plans and other source documents are summarized in appendix 5, which also contains a list indicating the abbreviations used in this document for each plan.

In the following descriptions of management for each program under this alternative, the wording in boldface type indicates existing decisions.

Cultural Resource Management

Foster a program of site evaluation and protection, and, where warranted, nominate sites to the National Register of Historic Places. Develop an areawide management plan for sites listed on the National Register to guide active management of

Alternatives

these resources for the benefit of the public (BMFP). (Document abbreviations are listed in appendix 5.) Historic sites in the resource area that are on the National Register are Cantonment Reno and Dull Knife Battlefield.

Apply "no surface occupancy" provisions to leases for oil and gas under Cantonment Reno, Crazy Woman Battlefield, Dull Knife Battlefield, the Outlaw Cave Archeological District, the Kinney Crossing site, and approved buffer zones for each, as determined by the area manager. Require camouflage for facilities within any additional scenic corridors surrounding the buffer zones to make them compatible with the surrounding scenic values (BOG).

Protect the Ruby site, the Indian Butte site, the Sawyer Wagon Train sites, and the LX Bar Ranch through withdrawals from mineral activity or by other protective measures (BMFP).

Prohibit surface occupancy on oil and gas leases containing sites listed on or determined eligible for listing on the National Register (BOG). These sites would be subject to the following stipulation:

No surface occupancy will be permitted on National Register eligible sites (name or number of site) or on appropriate buffer zones around the sites. The buffer zones will take into consideration factors such as visual intrusion, integrity of location, design, setting, materials, workmanship, feeling, or association of the property that contributes to its significance in accordance with National Register criteria. Facilities adjacent to buffer zones may require special painting as determined by the area manager.

If significant evidence of the Bozeman Trail should be found, develop appropriate consultation and mitigating measures (WPRA). Segments of the Bozeman Trail fall within high and moderate potential coal areas. This trail represents an important historical resource; thus, potential lease tracts would be surveyed for trail remnants prior to leasing. Trail evidence would be evaluated in terms of the BLM Wyoming State Office "Guidelines for the Evaluation of Historical Wagon Trails."

Establish a 1/4-mile buffer zone around the LX Bar Ranch site and prohibit coal leasing inside the buffer (WPRA).

Rationale: The sites listed are believed to have high enough historical and cultural value that they should be preserved for further study and for the enjoyment of future generations. All of the identified sites are potentially eligible for nomination to the National Register of Historic Places.

Fire Management

Practice full suppression of all fires in the resource area. Allow no prescribed burning in the resource area except as described in the Middle Fork fire management plan.

Fire Control Outside of Management Plan Areas

In the parts of the resource area not covered by fire management plans, the value of the resources that could be damaged or benefited by fire will be the major criterion for determining suppression action. Resources for which the value-at-risk is high will receive most protection. Fire problem classes will be determined by combining value-at-risk with fire behavior and fire occurrence. Areas having higher problem class ratings will be given greater protection, with problem class 6 receiving the highest priority. Problem class 6 areas in the Buffalo Resource Area are the Fortification Creek area, which contains a WSA, and the south Big Horns, where there are two WSAs and the Middle Fork Management Area (see map 4).

Fire Control under Fire Management Plans

Fire management plans have been written for each WSA and for the Middle Fork Management Area. The decisions set forth in those plans are outlined below.

All wildfires occurring on or threatening a WSA or public lands in the Middle Fork Management Area will be aggressively attacked and suppressed. All actions will be carried out in a manner that results in the least resource loss and environmental damage. A resource advisor from the area will be assigned to the fire to advise on firefighting activities and to determine rehabilitation needs. Rehabilitation must include the following practices.

All fire lines constructed on slopes of 25% or more will be rehabilitated to prevent erosion. Rehabilitation measures may include construction of water bars, backfilling, seeding, and planting as necessary.

Other measures such as seeding and planting of the entire burned area may be employed if called for in the rehabilitation plan. Rest and deferment of the burned area from domestic livestock grazing may be required to aid in the burned area's recovery. A minimum of two growing seasons' deferment is required.

Alternatives

for all areas that have been seeded or planted. Only native species may be used for seeding or planting.

Vehicles are to be driven only on existing roads and trails in the WSAs and on roads and trails as much as possible in the Middle Fork Management Area. Cross-country travel is permitted in the Middle Fork Management Area but is limited to areas where such travel can be done without causing damage to vegetation or cause erosion. Helipost construction will not be permitted in these areas because helicopters can land in natural open areas, of which there are several in the WSAs and the Middle Fork Management Area. Exceptions may be made to prevent loss of life or to evacuate injured persons.

Heavy equipment such as steel-tracked vehicles or tractors is not to be used to construct fire lines in the WSAs except to prevent loss of life or high value property. Such equipment is not to be used in the Middle Fork Management Area except to prevent loss of life or to protect private or state lands. The use of heavy equipment outside the boundaries of these areas is permitted so that the spread of fire onto adjacent lands can be prevented or so that fires can be prevented from reaching the WSAs or the management area.

All fire camps and heliports in the Middle Fork Management Area will be located in areas where the resulting impacts are minimal and are capable of being easily rehabilitated. Vehicle access will be provided to fire camps and heliports.

All fire camps and heliports for the WSAs will be located outside WSA boundaries. The maps in

the fire plans for the wilderness study areas show several possible locations on public land, all of which can be reached by vehicles.

The use of prescribed fire is permitted in the Middle Fork Management Area to control brush, to reduce hazardous fuel buildups, to improve wildlife habitat, to improve watershed, or to enhance tree regeneration by reducing competition, preparing seedbeds, and speeding up the decomposition processes.

The rationale for aggressively attacking and suppressing wildfires in the Middle Fork Management Area is as follows:

To decrease the potential for large fires due to the relative inaccessibility of the area and buildups of fuels from a long period of fire exclusion

To prevent damage to lands other than public lands in the area

To prevent destruction of important wildlife habitat, in particular, portions of the Ed O. Taylor Big Game Winter Range

To prevent damage to important fishing waters

The rationale for aggressively attacking and suppressing wildfires in WSAs is as follows:

To prevent damage or destruction of surface improvements on adjoining private or state land by escaping fires

To prevent large fires due to the accumulations of fuel resulting from a long period of fire suppression

To prevent destruction of important wildlife habitat

Appendix 4 describes fire management practices in more detail.

Forest Management

Suspend or adjust livestock grazing on timber harvest areas whenever grazing would impair successful regeneration (BMFP). Livestock grazing may be reauthorized on the timber harvest areas after successful reestablishment of a new stand of trees (approximately 10 to 15 years).

Rationale: Authorized livestock grazing has contributed to preventing the successful reestablishment of vegetation on commercial forestlands where timber has been harvested. Livestock have shown a preference for the new vegetation growth that becomes established following a timber harvest. Tree seedlings are therefore subjected to browsing and trampling.

Implement forest thinning and planting projects in the next ten years (BMFP). Legal descriptions are included in appendix 4.



Alternatives

Rationale: Forest development projects will be implemented at levels sufficient to support the proposed ten-year harvest schedule. Forest development projects are used as management tools to enhance the growing conditions on forestlands. The allowable harvest level is directly related to the growth on commercial forestlands. Therefore, to sustain the proposed ten-year harvest level, growing conditions on forestlands must be improved.

Log ponderosa pine through partial cuts; log Douglas-fir, lodgepole pine, and Englemann spruce either by partial cuts or by clearcuts not to exceed 20 acres, unless special conditions exist (BMFP).

Approximately 165 acres would be clearcut in cutting units of less than 20 acres each. About 3,135 acres would be harvested via partial cuts. The yield would be about 6,000 board feet (6 MBF) per acre from clearcut areas and about 3 MBF per acre from partial cuts (BMFP). Legal descriptions of areas of timber harvest are available at the Buffalo Resource Area office.

Rationale: The prescribed cutting systems would be compatible with wildlife and recreation objectives in the south Big Horns.

Do not allow harvesting of forest products from woodlands unless it is necessary to control disease or insects (BMFP).

Rationale: Woodlands have been determined to be more important for wildlife habitat, aesthetic values, and watershed protection than for timber management.

Offer for sale approximately 5.6 million board feet (5.6 MMBF) of sawtimber from 1985 through 1991. The timber would be offered according to the following schedule (THP).

Fiscal Year 85, Baldwin Creek, 500 MBF (200 acres)
FY 86, Poison Creek, 1 MMBF (200 acres)
FY 87, Horn, 2 MMBF (300 acres)
FY 88, Red Springs Reservoir, 200 MBF (400 acres)
FY 89, Arndt, 500 MBF (200 acres)
FY 90, Gardner Mountain area (outside the WSA), 1 MMBF (300 acres)
FY 91, Lost Creek, 250 MBF (50 acres); Upper North Fork, 200 MBF (50 acres)

The above timber sale schedule includes the timber sales remaining to be offered from the original south Big Horns ten-year timber harvest plan (1982-1991).

Rationale: Identifying sale areas and offering an allowable timber harvest brings the forestlands into a state of management and helps to contribute to the economic stability of local communities and industries that depend on timber offerings.

Acquire easements for forest management purposes across specific private and state lands (THP). Legal descriptions of the specific areas involved are in appendix 4.

Rationale: The acquisition of easements for forest management purposes is an essential step in helping to bring the commercial forestlands under management. Most of the commercial forestlands are not legally accessible because the land pattern consists of intermingled private, state, and federal lands.

Grazing Management

Existing grazing administration is described in chapter 3. Regardless of which alternative is selected, current management will be continued until the final RMP/EIS is complete, in accordance with a court agreement with the Natural Resources Defense Council (NRDC). The management decisions are summarized below.

Maintain authorized use on 408 grazing leases at 94,545 animal unit months (AUMs), and maintain one existing AMP. Authorize livestock grazing use, including livestock numbers, kind of stock, and period of use, at the same rate as at present on the individual leases (see appendix 6).

Reconstruct or maintain approximately 10 to 12 range improvements each year. The projected annual rate of each of these projects is as follows:

Two to 3 fence projects totaling about 3 miles, 3 to 4 pipelines totaling about 4 miles, 1 or 2 reservoirs, 1 or 2 wells, 1 spring, and 1 miscellaneous project. Miscellaneous projects are such items as erosion control, check dams, corrals, or water storage tanks.

Fence the heads of spring developments to protect the immediate areas. Determination of the exact area to be fenced in each case would be subject to the approval of the district manager or the area manager (BMFP).

Rationale: The quality of water would be improved and siltation would be reduced. This would benefit wildlife.

Continue to implement a program for control of designated noxious weeds according to the EA for the noxious weed control program (USDI, BLM 1982b). The program would include preventive, physical, biological, and herbicidal control measures. Mitigative measures that would be included in the program are detailed in appendix 4.

Alternatives

Rationale: This decision would provide a means of controlling noxious weeds while protecting the human and biological environment.

Lands and Realty Management

Consider locating new energy transmission or transportation facilities that cross one or more boundaries of the planning area within a compatible distance of existing facilities (CS).

What is considered a "compatible distance" will be determined case by case in consideration of minimum design standards and major impacts to the human environment. Space between utilities in the same corridor must be sufficient to permit expansion and modernization. State and federal highway routes that cross BLM-administered public lands will be selected in cooperation with the agencies involved. An effort will be made to establish corridors containing roads and utility facilities together, but not at the expense of additional construction costs or interference with scenic values or human activity.

This policy would apply to any power line with an "H" type structure or larger; to any transportation pipeline 6 inches in diameter or larger, regardless of volume; to major collector highways; and to all main railroad lines leading out of the resource area. In effect, this recommendation would establish corridors around existing facilities. New corridors would be considered only when location within a compatible distance of existing facilities could be demonstrated to be impractical and unfeasible and where the environmental impact could be mitigated.

Rationale: Major energy transmission and transportation facilities have already been constructed within the planning area. Establishing corridors around the existing facilities and locating new facilities within these corridors would mitigate adverse environmental impacts and right-of-way problems and would help to solve landowner concerns and problems of design and surveying.

Establish a north-south corridor along the west side of the Powder River, starting about 10 miles east of Kaycee, Wyoming (WPRB). The corridor would extend north along the proposed REA transmission line near Arvada, Wyoming, to the Montana state line. The following location restrictions would apply:

A minimum 2-mile buffer zone would be maintained along the west side of the Powder River.

Where possible, the corridor would be routed to avoid high and moderate potential coal, regardless of whether the coal is private, state, or federal ownership.

The following types of facilities would be considered for placement inside this corridor: 69 KV and larger transmission lines, pipelines 6 inches and larger in diameter, railroads, and access roads for these facilities.

This planning constraint established only a corridor area. Actual location of the corridor would be determined on the basis of the restrictions listed above and environmental and other factors. These considerations would be made after receipt of a right-of-way application. No coal has been eliminated from further consideration by this multiple use decision.

Rationale: Corridors will be needed for new facilities associated with potential coal development.

Issue all future rights-of-way for communication sites and utilities on the Pumpkin Buttes case by case in accordance with the Pumpkin Buttes communication site plan (PB). The site is shown on map 6. All rights-of-way would be located on South Middle Butte until such time as this butte had been fully utilized as a communication site. Rights-of-way would not be permitted on North Middle Butte unless an applicant could show that no other butte would provide the line of sight needed for that facility.

Applicants must obtain access to the buttes from the private landowner until the BLM can obtain an easement for a road. Maintenance of such roads and annual inspections would be carried out by the BLM (PB). Mitigative measures are described in appendix 4.

Rationale: This decision will facilitate management of a limited resource; that is, a location suitable for communication sites.

Prohibit surface occupancy for oil and gas development in the R&PP areas for the cities of Gillette and Sheridan (RPP-C; RPP-S; BOG).

Rationale: This decision would prevent a conflict between oil and gas development activities and development of the recreation and public purpose (R&PP) sites (see Glossary).

Dispose of only about 5,000 acres designated for disposal in Campbell County (BMFP). Lands identified for disposal in Campbell County are listed in appendix 4.

Alternatives

Rationale: Removing scattered parcels from federal ownership would also remove lands that are uneconomical to manage. "Blocking up" federal lands by exchange would provide better management units for both private and federal land managers.

Investigate the value of making land ownership adjustments on public lands in Campbell County, first by R&PP disposal, then by exchange, and finally by BLM-initiated public sales (BMFP).

It should be noted that the BLM will enter into an exchange only when another party agrees to such an exchange. If R&PP opportunities are not available, then exchange possibilities for other public lands will be considered. Exchanges will be guided by the philosophy that the BLM must acquire land of greater public use value than that exchanged. Exchanges that most benefit BLM programs will be made first.

If neither of the above opportunities exists, then the BLM would consider public sale of some BLM-administered land. The BLM will not entertain privately initiated requests for purchase of public lands.

Do not consider disposal of tracts identified for sale or exchange if they are within high to moderate potential coal areas\$Sta1 (BMFP). The legal descriptions for the lands available for exchange are listed in appendix 4.

Minerals Management

Leasable Minerals

Coal

Federal coal land Identified In the Highlight, Gillette, Recluse, and Western Powder River coal amendments would be available for further competitive and noncompetitive coal leasing (HRA, GRA, RRA, WPRB).

These lands encompass about 781,000 acres and contain about 62 billion tons of uncommitted federal coal after application of the coal screening process. This includes preference right lease applications (75,000 acres containing 6 billion tons) and delineated coal tracts (95,000 acres containing 6 billion tons). In addition, all federal coal leases are included in this alternative (127,000 acres containing 8 billion tons). Total federal coal in this alternative is about 908,000 acres containing about 70 billion tons of coal. The four coal amendments are summarized in appendix 2.

Defer oil and gas leasing on land covered by federal coal leases for which mining and reclamation plans have been approved until coal mining is completed (BOG). However, any land inside of, and ½ mile from the edge of, the mine area could be leased for oil and gas development with a "no surface occupancy" stipulation.

Rationale: This decision would prevent surface use conflicts during the life of each coal mine while permitting access to the oil and gas in that area by drilling from outside the coal lease area.

When oil and gas leases are issued for any land wholly or partly covered by a PRLA or by a federal coal lease for which there is no approved mining and reclamation plan, apply a stipulation regarding existing valid rights for coal development (BOG). The stipulation is to be worded as follows:

This lease is subject to (coal lease or PRLA number). Stipulations addressing concurrent operations will be attached at the time of approval of the application for permit to drill. Plans for oil field development and proposed secondary recovery will be made in cooperation with the BLM and the coal lease holder.

Rationale: Application of this provision to leases would alert oil and gas companies to special coordination and expense necessary if extraction of oil and gas and coal were to be carried out concurrently.

Oil and Gas

Lease federal oil and gas in the resource area subject to standard BLM statewide stipulations.

The oil and gas stipulations and mitigative measures detailed in appendix 4 were developed in the Buffalo oil and gas EA (USDI, BLM 1980b) and the Fortification Creek oil and gas EA (USDI, BLM 1982). Stipulations would be applied before an application for permit to drill (APD) was approved. The determination of which stipulations would be applied in each APD would depend on a site-specific analysis made by the BLM.

Development of federal oil and gas estates contained in five post-FLPMA leases inside the wilderness study areas would be allowed if the oil and gas development could be carried out without impairing wilderness values. Development in the North Fork WSA is subject to mitigating measures defined in the Buffalo oil and gas EA (USDI, BLM 1980b). Development in the Fortification Creek WSA is subject to the mitigating measures defined in the Fortification Creek oil and gas EA (USDI, BLM 1982).

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No other federal oil and gas estate inside the WSAs would be available for leasing until Congress renders a decision on whether or not these WSAs are to be included in the National Wilderness Preservation System. If Congress decides not to designate the WSAs as wilderness, future leasing and development would be conditioned by the EAs previously mentioned and by other mitigating measures that might be required to protect unique values.

Defer coal leasing in producing oil and gas fields until coal development would not interfere with the economic recovery of the oil and gas resource. Oil and gas fields would be determined by boundaries of known geologic structures (KGSs). KGS boundaries, locations, and areas, which are determined in terms of time, depth, and location, are not static. Future drilling and exploration work in a given area can enlarge KGSs or create new ones in locations where prospects for oil and gas development previously had been considered poor. Coal leasing would be allowed

where it can be shown that economic recovery of oil and gas is or will be completed before possible coal mining operations would begin.

The coal screening process has been applied on federal coal lands in KGSs. Therefore, it would be possible to lease coal in a KGS whenever the BLM determines that all or portions of a KGS are no longer required for oil and gas operations or that site-specific conflicts between oil and gas production and coal development can be mitigated.

The public would be invited to supply information regarding oil and gas operations during the formal call for expression of interest in coal leasing. If the BLM concurs with the information indicating coal leasing would not interfere with economic recovery of the oil and gas in a KGS, then a coal tract could be delineated in the KGS and could be considered further for coal leasing.

Before potential coal lease tracts are delineated, the BLM site-specific analysis team would conduct a field review of possible lease tract areas,

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especially where there is high coal leasing interest. Any new information gathered during the field review regarding oil and gas operations would be considered before delineation of coal tracts. This could result in KGS areas being available for coal leasing or new areas being deferred where conflicts exist.

Following tract delineation, any new oil and gas operations occurring within a coal tract or new oil and gas information regarding a tract would be analyzed during the coal activity planning process.

Rationale: Coal leasing would be deferred on about 175,000 acres containing about 20 billion tons of federal coal. The procedures for arriving at and applying this planning decision have been developed by the BLM under Department of the Interior guidance for mitigation of oil and gas and coal development conflicts. The intent of the decision is to maximize production of energy resources and not to develop one resource to the detriment of another. Adequate quantities of coal are available for potential new leasing to prevent conflicts between coal and oil and gas in most cases.

Salable Minerals

Dispose of mineral materials in Johnson and Campbell counties in areas identified in the mineral materials disposal plans for those counties (USDI, BLM 1980f, 1982k). In addition, process disposal of minerals from other sites on demand (MMDP). Locations for disposal are included in appendix 4.

Disposal of mineral materials from Johnson and Campbell counties would be handled as follows:

Material sales would be initiated through a program of public contact. Competitive sales would be emphasized where possible. Priorities for disposals would be as follows: (1) state and county highway department needs; (2) energy minerals industry needs such as construction and maintenance of oil field roads or surface facilities for uranium mines; (3) other uses.

Rationale: Identification of deposits and use of known sites would streamline disposal actions.

Prohibit the use of known good to high quality concrete aggregate deposits for anything other than concrete aggregate (MMDP). Operational procedures that would be followed and special stipulations governing mineral material disposals are outlined in appendix 4.

Recreation and Visual Resource Management

Areawide Recreation

All public lands in Johnson County have been designated as either open, closed, or available for limited off-road vehicle use (ORV). These designations apply only to BLM-managed public lands within Johnson County. All designations would be evaluated continuously for effectiveness, and areas might be reclassified according to the BLM planning system or in response to resource-related problems. The specific classifications are described in the "Recreation" section of chapter 3.

Rationale: ORV designation, which has been mandated by Executive Orders 11644 and 11989, will help reduce resource damage such as soil disturbance, loss of vegetation, and disturbance to wildlife, which could be caused by indiscriminate vehicle use on public land.

Provide access to public land with potential for public recreation only after detailed recreation planning is complete and only if funds and personnel are available for development and supervision of such areas (BMFP). Access to each area could be by trail or road, as appropriate.

Rationale: This decision would prevent resource damage from intensive recreation use in areas where facilities to support the activity were not available.

Prohibit surface occupancy for oil and gas leasing on lands in the Red Wall/Hole-in-the-Wall area (see map 10) (BMFP).

Rationale: This decision would help protect the scenic quality of the Red Wall, which has been nominated as a National Natural Landmark.

Prohibit surface occupancy for oil and gas on North Middle Pumpkin Butte and South Middle Pumpkin Butte (see map 10).

Rationale: The Pumpkin Buttes are visible for many miles in all directions and are considered scenic landmarks. This decision would help protect the scenic quality of the buttes.

Prohibit surface occupancy or other surface disturbing activities in the Dry Creek Petrified Tree Environmental Education site (see map 3).

Rationale: This decision would protect the site from noncompatible resource uses.

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Prohibit surface occupancy or other surface-disturbing activities within 200 feet of state and federal highways and county roads.

Rationale: Establishment of a buffer zone would help to reduce the safety hazards and visual effects associated with BLM-related activities along heavily used public roads. Visual effects are extremely sensitive in high use areas such as highways.

Middle Fork Area Recreation

Prohibit surface occupancy within ½ mile of the Middle Fork Canyon rim (see map 10) (MFRMP).

Rationale: Oil and gas exploration and development in the area would pose a significant threat to cultural resources, to the Middle Fork fishery, to critical wildlife habitat, and to canyon aesthetics.

Prohibit exploration, drilling, and related development activity in the Middle Fork Management Area from November 30 to July 1 (MFRMP). This limitation would not apply to maintenance of producing wells.

Avoid road construction through juniper, mountain mahogany, or timber stands, if practical, in the Middle Fork Management Area (MFRMP).

Rationale: These provisions would help to protect the scenic quality of the area and important wildlife habitat.

Prohibit drilling on ridges in the Middle Fork Management Area (MFRMP).

Rationale: Keeping drilling off ridges would prevent skylining, thus helping to protect the scenic quality.

Require muffling of production engines to limit noise levels to a maximum of 65 decibels when measured 100 feet from the source.

Rationale: Muffling requirements would reduce disturbance of recreationists by noise and reduce stress on wildlife during critical winter periods.

Soil, Water, and Air Management

Do not allow oil and gas exploration or extraction activities within 500 feet of any stream, reservoir, or well (BMFP). This provision could be waived by the area manager or district manager.

Rationale: This provision would help to prevent contamination of live water from possible oil spills and caustic materials used in drilling operations.

Require that rehabilitation of land that has been mined or affected by any mineral development must include covering the area with soils suitable for restoration (BMFP).

Rationale: This requirement would improve reclamation by promoting vegetation growth and thus reducing erosion.

Prohibit exploration, drilling, or other development activity in areas of severe erosion hazard from March 1 through June 15 (see map 12) (BOG). This limitation would not apply to maintenance of producing wells. Exceptions in any given year could be specifically authorized in writing by the Buffalo area manager.

Rationale: Seasonal restrictions would reduce or prevent soil erosion and subsequent pollution of surface water and aquatic habitat, as well as the possibility of reserve pit failure and spillage of toxic material.

Do not allow the placement of roads or other improvements on slopes of more than 25% until BLM personnel have made an on-the-ground inspection and determined that feasible stipulations to protect the watershed can be attached to the proposed action and can be enforced (see map 12) (BMFP).

Rationale: This decision would provide for attachment of mitigating measures or consideration of alternative routes or locations.

Management of WSAs

The three areas being studied for wilderness would be managed in accordance with the BLM wilderness management policy. Management would be for multiple use under existing planning decisions made in the Buffalo MFP, which was completed in 1979. Appendix 7 details specific management direction for each area. The decisions are summarized briefly below.

ORV designations in the WSAs would be in accordance with the Johnson County ORV plan. Gardner Mountain and North Fork WSAs would be managed as visual resource management (VRM) Class II areas, and Fortification Creek WSA would be managed as a VRM Class III area (see Glossary).

Management under this alternative would continue the present levels of resource use and management as documented in the existing MFP. Many planning decisions for the WSAs were deferred when the MFP was prepared because

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wilderness review was forthcoming. For that reason, this alternative does not include site-specific decisions for the management of forests, grazing, or wildlife habitat in any of the WSAs or for minerals management in Gardner Mountain or North Fork WSAs.

Wildlife Habitat Management

General

Prohibit surface occupancy for oil and gas in the following big game ranges: Ed O. Taylor, Kerns, Bud Love, and Amsden (BOG).

Rationale: This restriction would provide protection for elk habitat by preventing deer and elk displacement and destruction of forage.

Prohibit surface-disturbing activity in crucial deer and antelope winter range from November 30 through May 1 and in fawning areas from May 1 through June 15 (BMFP).

Rationale: This restriction would protect these species during times of stress.

Prohibit surface-disturbing activities within identified crucial elk or bighorn sheep winter range (see map 14) from November 30 through May 1, and prohibit surface occupancy within identified elk calving or bighorn sheep lambing areas (BMFP, FOG). Oil and gas produced within the winter ranges would have to be piped to tank batteries or treatment facilities outside the ranges. temporary storage facilities may be constructed on the locations.

Rationale: These restrictions would prevent increased stress on these species at times when their energy reserves are already low.

Prohibit surface occupancy within 250 yards of identified sharp-tailed grouse dancing grounds (see map 14) at any time, and prohibit surface disturbance within a ½-mile radius of sharp-tailed grouse dancing grounds from April 1 through May 30 (BMFP). This seasonal limitation would not apply to maintenance and operation of existing facilities.

Rationale: These restrictions would prevent interference with the mating and brooding of the grouse, aiding in the propagation of the species.

Permit vegetative manipulation on important seasonal antelope, elk, deer, and sage grouse habitat on public land (see map 14) only if on-the-ground analysis determines that such activity will benefit these species (BMFP).

Rationale: This decision would prevent disturbance or eradication of forage that may be critical to the species involved.

Prohibit occupancy or other surface disturbance within a ¼-mile radius of the center of a sage grouse strutting ground (lek), with no exceptions. Prohibit surface-disturbing activity within an additional 1 ¼-mile radius from March 1 to June 15. (BMFP). Exceptions to seasonal use limitations in any year could be specifically authorized in writing by the district manager, BLM (BMFP).

Rationale: These restriction would prevent disruption of breeding activity. Such disruption could cause subsequent reproductive failure whereby entire local populations could be affected.

Fence reservoirs covering 5 or more surface acres, allowing about 5 acres of upland habitat for each surface acre of water (BMFP). Livestock water should be piped to a tank with float valve well below the dam. All such projects should be maintained regularly by either BLM personnel or the range user under cooperative agreement.

Funding for such projects may be available either under the Sikes Act, which provides for projects to benefit wildlife, or through BLM range programs. If the area should warrant an HMP or an AMP, these specifications could be modified to conform with the recommendations of that plan. This decision could be changed by approval of the district manager or the area manager if it was deemed impractical (BMFP).

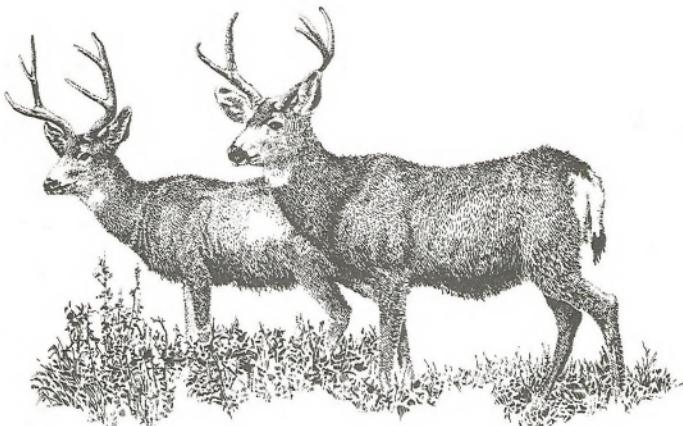
Rationale: Exclusion of livestock from spring and pump areas and from reservoir shorelines would improve the quality of water available for wildlife and livestock. Protection of these areas also would reduce siltation of reservoirs and provide for improvement of small areas of riparian habitat.

Prohibit surface disturbance or occupancy from March 1 through June 30 within a buffer zone around active nests of raptor species of high federal interest (BMFP). Species included are golden eagles, bald eagles, peregrine falcons, prairie falcons, burrowing owl, ferruginous hawk, osprey, and merlin (see map 14).

Rationale: This restriction would help to protect species identified on the federal "high interest species" list.

Prohibit surface occupancy at all times within ½ mile of communal bald eagle winter roosts (see map 14), and prohibit surface disturbance from November 1 through March 31 within a biologic buffer zone (BMFP). The BLM would establish

Alternatives



the buffer zone, after a field inspection, on the basis of topography, vegetative screening, and essential foraging areas.

Rationale: This decision would prevent disturbance of the birds during an already stressful time of year.

Develop an HMP to improve and protect waterfowl on 62 reservoirs (BMFP). The BLM would coordinate planning with grazing lessees to resolve any conflicts. If it would be advantageous, the shallow end of each reservoir would be fenced and planted with emergent vegetation. Islands would be constructed in the 17 reservoirs that have more than 2 acres of surface.

Should any of these sites be leased for mineral extraction, the lease would include the following provision: "The company will make available a comparable waterfowl area during the mining period, and rehabilitate the site to the condition in which it existed prior to the mining" (BMFP).

Rationale: Development and implementation of this HMP would protect existing waterfowl habitat and create additional habitat.

Use any increases in forage production first, to stabilize the watershed; second, to be divided equally between livestock and wildlife uses. If there is competition between domestic livestock and wildlife in a given area (BMFP).

Rationale: This decision would make increased forage available to wildlife.

Continue to implement the USFWS animal damage control program on public land in the resource area (ADC). This plan does not cover rodent control, which would be addressed in a separate document. Human safety considerations and environmental concerns would be considered.

Methods to be used in predator control on public lands are limited only by the policy of the U.S. Fish and Wildlife Service (USFWS), subject to restrictions as outlined in appendix 4. The USFWS would use whatever control methods are within its authority, except as limited by the animal damage control plan.

Middle Fork Area

Provide sufficient forage and cover each year to support 900 elk during the winter in the Middle Fork Habitat Management Area (MFHMP). Actions to achieve this would be restrictions on vehicle access, improvement of forage on the Ed O. Taylor Game Range, strict oil and gas exploration stipulations, and improvement of range condition and livestock distribution (MFHMP).

Rationale: This decision would permit the resource area to maintain sufficient habitat for the optimum herd size.

Improve Middle Fork area mule deer habitat to provide for an annual population of 1,000 animals (MFHMP). To accomplish this, water developments

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would be constructed, the quality of mountain mahogany stands would be improved, timber cutting would be restricted, and vehicle and visitor access would be controlled.

Rationale: This decision would permit the resource area to maintain sufficient habitat for the optimum herd size.

Protect and Improve 76,903 acres of public land within the Middle Fork wildlife habitat area to provide key habitat for wildlife (MFHMP). To achieve this, the Buffalo Resource Area would prevent ORV abuse and identify and protect key habitat areas by restricting roads through mountain mahogany stands, preventing firewood cutting, and closing unneeded roads.

Increase the high shade cover along stream banks by 50% and streamside overhanging grasses, woody species, forbs, and general vegetative ground cover by 50% along controlled portions of streams (MFHMP). The resource area would accomplish this by restricting firewood cutting, restricting livestock grazing along the river, and controlling stream bank erosion (MFHMP).

ALTERNATIVE B: THE PREFERRED ALTERNATIVE

The preferred alternative would provide balance among competing demands by providing for the production of needed goods and services while protecting important and sensitive environmental values. It addresses identified issues in a balanced, cost-effective manner.

In resource programs in which no major issues were raised, present management would be continued. Changes have been made in the wording of some decisions for purposes of clarification.

The area manager could waive some decisions, as indicated, following a site-specific field inspection. Any special protective site-specific mitigating measures will be applied following the inspection.

In the following description of management for each program, the wording in boldface type indicates the decisions that the Buffalo Resource Area would carry out for that program under this alternative.

If this alternative is selected as the final RMP, the planning decisions in the source documents listed in appendix 5 would be superseded by the decisions in this alternative. The site-specific

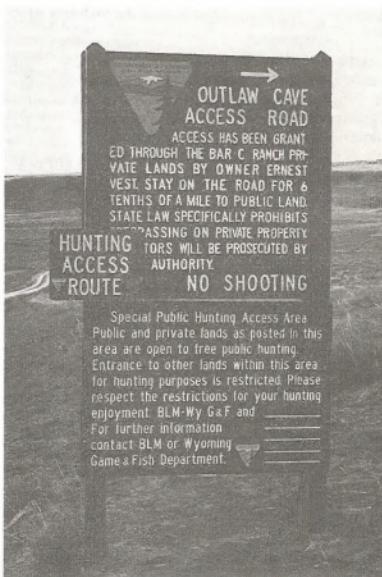
mitigating measures identified in the source documents would be used as applicable following a site-specific analysis.

Cultural Resource Management

CRM-1: Develop cultural resource management plans (CRMPs) for Cantonment Reno, Dull Knife Battlefield, and the Outlaw Cave Archeological District.

Both Cantonment Reno and the Dull Knife Battlefield, which cover 1,952 acres, are listed on the National Register of Historic Places.

Preliminary studies conducted on the Outlaw Cave Archeological District indicate that this district has one of the greatest potentials in Wyoming for revealing further information about our prehistoric forebears. Important cultural sites have been identified on about 33 acres of federal surface and 27 acres on "split estate" lands. No surface occupancy or disturbance would be allowed on those sites.



Alternatives

Management actions that have been identified for consideration in the CRMPs are described below.

Research goals, designs and strategies would be identified. (Any information that would contribute to the understanding of prehistoric and historic lifeways would be recovered and preserved.)

Necessary protection and excavation (recovery of archeological data) would be identified.

All artifacts and features would be mapped and recorded.

Significant artifacts would be collected and curated.

Sites would be extensively photographed.

Selected sites would be interpreted.

Significant sites in the Outlaw Cave Archeological District would be nominated to the National Register.

CRMPs would cover only federally owned sites. As additional sites are nominated to the National Register, similar CRMPs would be written and implemented.

Rationale: Intensive planning and management would provide the appropriate level of protection for sites recommended as eligible for the National Register and those formally determined to be eligible.

CRM-2: Conduct Class III (Intensive) cultural resource inventories before allowing surface-disturbing activities in the areas listed below. (Surface disturbance is defined in the Glossary.)

Gardner Mountain (Ts 43-45N, Rs 83-85W)

Fortification Creek (Ts 51-53N, Rs 75-77W)

Middle Fork (Ts 41-43N, Rs 83-85W)

Pumpkin Buttes (Ts 51-53N, Rs 75-77W)

Rochelle Hills (Ts 45-47N, Rs 69-70W)

All BLM-administered lands within ½ mile of the Powder River

According to the provisions of the Archeological Resources Protection Act of 1979, the operator is responsible for the protection of any prehistoric or historic site that would be eligible for the National Register of Historic Places.

Rationale: There is a high potential in these areas for the presence of significant cultural sites that could be damaged by surface-disturbing activities.

Fire Management

FM-1: Conduct full fire suppression in class III and IV value-at-risk areas (see map 4).

Full suppression would be practiced on approximately 165,000 acres of BLM-administered surface in value-at-risk classes III and IV. Full suppression also would be practiced in isolated areas within limited suppression areas to provide protection for structures, power lines, and other improvements.

The Middle Fork Fire Management Plan would be retained. Under this plan full suppression would be practiced on approximately 48,000 acres in the Middle Fork Management area.

Full fire suppression would be practiced within the boundaries of the WSAs (approximately 29,000 acres) until Congress has made a decision as to designation or nondesignation of the areas as wilderness. If the areas are not designated wilderness, fire suppression in each WSA would be determined according to the normal fire year plan.

Rationale: Full fire suppression in specified areas would prevent undue degradation of the environment and destruction of physical structures.

FM-2: Conduct limited fire suppression on all public land in value-at-risk class I and class II areas (see map 4).

Before limited suppression would be implemented, fire plans and EAs would be prepared. Efforts would be coordinated with owners of adjacent lands. Approximately 634,000 acres of BLM-administered surface, or 79% of the public land in the resource area, would be in areas of limited suppression. In determination of limited suppression areas, value-at-risk and fire problem classes would be considered. Resources for which the value-at-risk is low and areas having low problem class ratings would be considered for limited suppression.

Rationale: Limited fire suppression costs would more closely reflect the value of the resources being protected.

FM-3: Conduct prescribed burns.

Prescribed fire would be used as a management tool in support of other resource programs as described below. Site-specific plans and EAs would be prepared before implementation.

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In forest management, fire would be used for seedbed preparation and disease control on approximately 200 acres of forestland. It also would be used to reduce buildups of hazardous fuels and to break up the continuity of fuels so that the intensity of wildfire could be reduced.

For grazing management, prescribed fire would be used on approximately 500 acres to increase forage production and to convert brush to desired species.

For wildlife, prescribed fire would be authorized case by case on approximately 1,500 acres to improve and diversify habitat.

Grazing lessees/permittees would be authorized by permit to conduct prescribed burning on public lands in association with burning on their adjacent private land. Authorization for ignition will be given only after advance notification by the lessee and only after preparation of BLM guidance such as a burn plan, an EA, or a written prescription.

Rationale: Prescribed burning is one of the most cost-effective and environmentally acceptable means of controlling unwanted vegetation or infestations of insects or disease.

opment projects are used as management tools in order to enhance the growing conditions on forestlands. The allowable harvest level is directly related to the growth that is occurring on commercial forestlands.

Rationale: To sustain the proposed ten-year harvest level, growing conditions on forestlands must be maintained at certain specified levels.

FOM-3: Allow the sale of forest products (posts, poles, and fuelwood) from woodlands throughout the resource area.

A current MFP decision prohibits the sale of forest products from woodlands. Annual timber forest product offerings from commercial forestlands, when combined with annual sawtimber, will not exceed the ten-year allowable cut of 11 MMBF. Green timber forest product offerings from woodlands will not exceed the ten-year allowable cut of 1 MMBF. All dead timber and timber from noncommercial species is considered unregulated in regard to an allowable cut; therefore, such forest product offerings will be made within program capabilities. Sales of forest products will be made only after site-specific environmental analysis in which other resource values (such as wildlife and soils) are considered.

Forest Management

FOM-1: Suspend or adjust livestock grazing use in timber harvest areas whenever grazing would impair forest regeneration. Grazing could be reauthorized or readjusted to preharvest levels after successful reestablishment of a new stand of trees (approximately 10 to 15 years), but only when it would not impair the productive capacity of the forestland or when the area manager determined that grazing would not be incompatible with site-specific forest management objectives.

Rationale: The authorized use of livestock grazing on commercial forestlands where timber has been harvested could contribute to preventing the successful regeneration. Livestock have shown a preference for the new vegetative growth that becomes established following a timber harvest. Tree seedlings are therefore subjected to browsing and trampling.

FOM-2: Implement forest thinning and planting projects in the areas described in appendix 4. Forest development projects will need to be implemented at levels sufficient to support the proposed ten-year harvest schedule. Forest devel-



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Rationale: Forest product sales would be used whenever possible as a management tool to increase the overall vigor, and therefore the productive capacity, of the forestlands. Such sales also will contribute to the economic growth of local communities and industries.

FOM-4: Offer for sale approximately 9 MMBF of sawtimber over the next ten years in the following 11 priority timber harvest areas:

Gardner Mountain area (not in WSA), 1 MMBF (300 acres)
Baldwin Creek, 1 MMBF (200 acres)
Poison Creek, 1 MMBF (200 acres)
Horn, 2 MMBF (300 acres)
Red Springs Reservoir, 250 MBF (400 acres)
Arndt, 1 MMBF (200 acres)
Lost Creek, 250 MBF (50 acres)
Upper North Fork Reentry, 500 MBF (50 acres)
Lower Beartrap, 1 MMBF (200 acres)
Billy Creek, 500 MBF (125 acres)
Lower "H" Hill, 500 MBF (125 acres)

Map 6 shows the harvest areas. Changes could be made in the projected volume of these sales, and some areas could be deleted if biological or economic conditions warranted such actions.

Although the sale areas have been identified, the schedule allows flexibility in annual proposed offerings when such action is warranted by delays in acquiring easements or by changes in biological or economic conditions. Final decisions regarding which sale to offer in any particular year will be made after interdisciplinary review and development of site-specific plans and EAs.

Rationale: Identifying sale areas and offering an allowable timber harvest brings the forestlands into a state of management and helps to contribute to the economic stability of local communities and industries that depend on timber offerings.

FOM-5: Acquire easements across private and state lands for timber harvest and other forest management purposes as described in appendix 4.

Rationale: Many of the commercial forestlands are not legally accessible because of the intermingled land pattern of private, state, and federal lands.

FOM-6: Suspend or adjust livestock grazing on commercial forestlands if such activity is impairing the productive capacity of the forestland. Decisions to suspend or adjust livestock use on the "I" allotments would be made in conjunction with development and implementation of AMPs. Decisions regarding "M" (maintain) and "C" (custodial) allotments would be made case by case.

Rationale: The authorized use of livestock grazing on commercial forestlands has, in certain cases, resulted in an impairment of the long-term productive capacity of the forestlands as a result of soil compaction, browsing and trampling of seedlings, and rubbing of saplings.

Other decisions that apply to forest management are CRM-2, FM-3, LR-4, SWAM-1, SWAM-2, SWAM-3, WHM-1, WHM-2, WHM-3, WHM-4, WHM-5, and WHM-7.

Grazing Management

General

GM-1: Control noxious weeds on public surface lands. The noxious weed control program entails physical, biological, preventive, and herbicidal measures to control noxious weed infestations. Leafy spurge would be the principal noxious weed species controlled. Approximately 300 acres would be treated annually with Tordon 2K pellets, Tordon 22K spray, or other herbicides as described in the noxious weed control EA (USDI, BLM 1982b). The actual control work is done through a BLM contract with county weed and pest control districts.

Rationale: Control of noxious weeds on public lands helps to ensure that the intermingled public lands would not act as seed sources for reinestation.

Management of "M" Allotments

GM-2: Manage "M" category allotments as described below.

Continue the current authorized livestock use on 98 "M" allotments at 43,573 AUMs. Livestock numbers and kinds and the periods of use would be authorized as at present for each individual lease (see appendix 6).

Allow development of range improvements. Construction of range projects on the "M" allotments over the ten-year life of this project is estimated at 2 water developments (springs, reservoirs, pipelines, wells, etc.), 1 mile of fence, and 40 acres of vegetation manipulation. These projects are included in the schedule of range improvements in table 2-1. Range improvements would be constructed in conjunction with cooperative management agreements or individual project agreements and after preparation of a site-specific environmental analysis for the allotment involved.

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TABLE 2-1
NEW RANGE IMPROVEMENT SCHEDULE
UNDER ALTERNATIVE B ON
"M" AND "I" CATEGORY ALLOTMENTS

Kind of Improvement	Total Planned In Thirty Years	Number to be Completed In Ten Years
Wells	20	9
Springs	6	2
Reservoirs	10	5
Pipeline (miles)	31	15
Fence (miles)	60	17
Vegetation manipulation (acres)	2,000	500

Establish resource monitoring studies as necessary to detect undesirable changes in the current satisfactory resource conditions. One or more of the following could be monitored: range condition, trend, forage utilization, actual use, and climate. The number and intensity of monitoring studies would vary, depending on the resource value and potential for resource conflicts on a given allotment.

Baseline inventories consisting of range site and condition mapping would be conducted or updated in conjunction with development of cooperative management agreements. Site-specific resource management objectives also would be developed. Periodic allotment evaluations would be scheduled to determine progress toward meeting the objectives.

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An evaluation of the cooperative management plan will be scheduled within five years following implementation of this RMP. Subsequent evaluation would be scheduled as needed.

Rationale: Analysis of the "M" allotments has revealed no serious management problems and has shown resource conditions to be generally good. Current satisfactory management of grazing use could be recognized and documented through cooperative management agreements. Limiting of BLM-initiated management actions would permit concentration of personnel and range improvement funds on allotments where the highest returns on investments could be realized. Resource monitoring studies and evaluation of progress toward management objectives would ensure that no undesirable changes in resource conditions would occur.

Management of "I" Allotments

GM-3: Manage "I" category allotments as described below.

Conduct baseline inventories. Inventories are needed to update information on range sites and range condition. Site-specific resource management objectives would be established and opportunities identified through the inventories, which would include ranch unit analysis (see Glossary). Schedules would be based on the monitoring plan to be developed after the final EIS is completed.

Develop, Implement, and monitor AMPs. Livestock numbers, kinds, and periods of use would continue as now licensed (see appendix 6) pending adjustments made in conjunction with implementation of AMPs or analysis of allotment monitoring studies. Over the life of this plan, it is anticipated that 10 to 12 of the 29 AMPs would be developed and fully implemented (see table 2-2).

Resource monitoring studies would cover actual use, forage utilization, trend, and climate. They would be conducted according to the methodology established in a resource monitoring plan that is to be developed after this RMP is completed. The monitoring plan will follow guidance established in BLM instruction memos 82-292 and 82-330 and in sections of the *BLM Manual*.

The level of authorized use for livestock on the 10 to 12 "I" allotments is expected to increase from 28,968 AUMs to 32,218 AUMs by the end of the ten-year life of this plan. The authorized use for livestock on all 29 "I" allotments over the long

term (40 to 50 years) is expected to be increased to 41,968 AUMs. "I" allotments and their potential for improvement are detailed in table 2-2.

The priority for development of AMPs was established through application and evaluation of an allotment against the allotment categorization criteria (see appendix 3). The highest priority allotments for AMP development were those offering the greatest potential for improvement of unsatisfactory range condition, management, or resource condition and those offering the best return on public investments.

After range condition class has been upgraded to "good," allocate to wildlife the forage produced through implementation of AMPs to meet the WGFD's population objectives. Additional forage produced would be licensed for livestock use. After the range condition class is upgraded to "good," watersheds would be stabilized. About 2,400 "new" AUMs would be directed to wildlife to bring big game populations up to the levels recommended by the WGFD, which provided this information on an allotment basis. About 13,000 "new" AUMs would be licensed for livestock use.

Rationale: The grazing management decisions in this alternative would address the issues of unsatisfactory range condition and possible lack of wildlife forage and corresponding low populations through proposed decisions to increase forage production for livestock and wildlife in "I" category allotments.

Management of "C" Allotments

GM-4: Manage "C" category allotments as described below.

Continue current authorized livestock use. The 283 "C" allotments are licensed at 22,004 AUMs per year. Livestock kinds and numbers and the period of use would be authorized as at present for each individual lease (see appendix 6). The BLM's efforts on "C" allotments will be concentrated on functions of lease administration, including issuance of leases and billing notices, processing of range improvement applications, and handling lease transfers.

Assign low priority to funding of range improvement projects. Private investment would be encouraged through development of cooperative agreements with the individual operators and the Soil Conservation Service, U.S. Department of Agriculture (SCS) for allotment management and construction of range improvements. It is estimated

Alternatives

TABLE 2-2
APPLICATION OF CATEGORIZATION CRITERIA
TO "I" CATEGORY ALLOTMENTS

Lessee Number	Range Condition ¹		Management and/or Distribution of Livestock	Wildlife Water	High Potential for Competition for Forage between Livestock and Wildlife	Wyoming Game and Fish Department Big Game Objective			Potential for Economic Return on Public Investments	Priority Within Category ²	
	1954	1968				Deer	Elk	Antelope			
7007	U	S	Moderate	Improve	Maintain	No	Increase	—	Maintain	Moderate	Low
7058	U	S	Moderate	Improve	Maintain	Yes	Increase	—	Maintain	High	Medium
7086	U	S	Moderate	Improve	Maintain	Yes	—	—	Maintain	Moderate	Low
7102	U	S	Low	Improve	Maintain	No	Increase	—	Maintain	High	High
7103	U	S	*	Improve	Improve	No	Increase	—	Maintain	High	Low
7119	U	S	Low	Maintain	Maintain	Yes	Maintain	—	Maintain	Moderate	Low
7130	U	S	Moderate	Improve	Maintain	Yes	Increase	—	Maintain	Moderate	Medium
7137	U	S	Low	Improve	Maintain	No	Maintain	Maintain	Maintain	Moderate	Medium
7203	U	S	*	Improve	Improve	Yes	Maintain	Maintain	Maintain	High	High
7226	U	S	High	Improve	Maintain	Yes	Increase	—	Increase	High	High
7227	U	S	High	Improve	Improve	Yes	Increase	—	Maintain	Moderate	High
7235	U	U	Moderate	Improve	Improve	No	Increase	—	Maintain	Moderate	Low
7236	U	S	Low	Maintain	Maintain	No	Maintain	Increase	Maintain	Moderate	Low
7241	U	S	Low	Improve	Maintain	No	Increase	—	Maintain	Moderate	Low
7248	U	S	Low	Improve	Maintain	No	Maintain	—	Maintain	Moderate	Medium
7258	U	S	High	Improve	Maintain	Yes	Increase	Increase	Maintain	Moderate	Medium
7271	U	S	*	Improve	Improve	Yes	Increase	—	Maintain	High	High
7285	U	S	Moderate	Improve	Improve	No	Increase	—	Maintain	High	High
7348	U	S	Moderate	Improve	Improve	No	Increase	—	Maintain	High	Medium
7435	U	S	Low	Improve	Improve	No	Increase	—	Maintain	High	Medium
7529	U	S	Moderate	Improve	Improve	No	Increase	—	Maintain	Moderate	Medium
7562	U	S	High	Improve	Maintain	No	Maintain	Increase	—	High	High
7581	U	S	Moderate	Improve	Maintain	No	Increase	—	Maintain	Moderate	Medium
7628	U	S	Moderate	Improve	Maintain	No	Maintain	Increase	—	High	High
7630	U	S	High	Improve	Maintain	No	Maintain	—	Maintain	High	High
7645	U	S	Moderate	Improve	Maintain	Yes	Increase	—	Maintain	Moderate	High
7646	U	S	High	Improve	Improve	Yes	Increase	—	Maintain	Moderate	High
7660	U	S	Moderate	Improve	Maintain	No	Maintain	Increase	Maintain	Moderate	Medium
7662	U	S	High	Improve	Maintain	Yes	Decrease	—	—	High	High

¹Allotments noted with an asterisk were partially inventoried in 1983. Data from the inventory are summarized in table 3-11.

²U = unsatisfactory, which is defined as more than 30% of the allotment being in fair or poor condition. S = satisfactory, which is defined as less than 30% of the allotment being in fair or poor condition.

³Improvement potential is a subjective evaluation of the opportunity for improvement of range condition in an allotment. The evaluation is based on the professional judgment of BLM range conservationists.

⁴Allotments will be selected for development of AMPs from the 13 "I" allotments identified in the table as having high priority.

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that one SCS ranch plan would be implemented and three or four range improvement projects would be constructed annually on "C" allotments.

The projects would be constructed under SCS ranch plans, coordinated resource management plans or individual project agreements. A site-specific EA would be developed before range improvements were constructed on public land.

Rationale: The small size and scattered public land pattern characteristic of "C" allotments severely limits the BLM's management options. The return on public investments in range improvements or management normally would be very low on these allotments, but the BLM could

encourage proper grazing management by providing the administrative clearances for construction of range improvements. The intermingled public lands in these allotments also could benefit from conservation management recommendations provided by the SCS under the Great Plains conservation plans.

Other Applicable Decisions

Other program decisions that apply to grazing management are CRM-2, FM-3, FOM-1, FOM-6, LR-4, RVRM-3, RVRM-4, RVRM-5, SWAM-1, SWAM-2, SWAM-3, SWAM-4, WHM-1, WHM-2, WHM-3, WHM-4, WHM-5, and WHM-7.

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Lands and Realty Management

LR-1: Locate transmission and transportation facilities within the corridor areas shown on map 6. The facilities included are power lines 69 kilovolts and larger on "H" type and lattice type structures, pipelines 6 inches in diameter or larger (excluding feeder or gathering lines in producing fields), state and federal highways, and railroads leading out of the planning area.

Facilities would be placed within a compatible distance of existing facilities. The definition of "compatible distance" would be determined case by case in consideration of minimum design standards and major impacts to the human environment. Space between utilities in the same corridor will be sufficient to permit expansion and modernization. State and federal highway routes that cross BLM-administered public lands will be selected in cooperation with the agencies involved. An effort will be made to establish roads and utility facilities in the same corridor, but not at the expense of excessive additional construction costs or interference with scenic values or human activity such as enjoyment of a scenic view from a highway.

In effect, this decision would result in establishment of corridors around existing facilities. New corridors would be considered only when new facilities would be at least $\frac{1}{2}$ mile from existing corridors or when the environmental impact could be mitigated.

Rationale: Most adverse visual impacts, land owner concerns, survey problems, and problems related to rights-of-way can be mitigated by establishment of corridors around the existing facilities and location of new facilities within these corridors.

In some instances existing facilities are not in the optimal location; however, it is assumed that the expense and environmental impacts of relocating existing facilities to the optimal location would be greater than leaving them in their present locations.

LR-2: Locate communication sites and utilities In the Pumpkin Buttes area only on South Middle Butte until that butte has been fully utilized as a communication site. Communication sites would not be authorized on North Middle Butte unless it became absolutely necessary to use that butte for the line of sight needs (such as for microwave transmission). Mitigative measures will be applied as described in appendix 4.

Rationale: Hilltops with sufficient elevation to provide an adequate transmission range are scarce in this area. Management is necessary to avoid the random and potentially inefficient use of those types of sites. This decision would aid management of a limited resource, locations that are suitable for communication sites.

LR-3: Prohibits surface disturbance or occupancy associated with development of federal oil and gas reserves in the R&PP areas unless the prohibition is waived by the area manager.

Exploration and development from oil and gas and other minerals entail use of large equipment and other activities that could pose a safety hazard to the general public. R&PP areas total approximately 600 acres.

Rationale: This decision would prevent possible conflicts related to public safety, visual resources, or other matters between R&PP development and mineral activities.

LR-4: Lands shown on map 7 are available for further consideration for disposal. Consider case by case the possible disposal of lands in producing oil and gas fields (KGSS), high interest coal areas, and designated mineral material sites.

The approximate amounts to be considered for disposal are 32,000 acres by sale and 63,000 acres by exchange in Campbell County; 20,000 acres by sale and 45,000 acres by exchange in Johnson County, and 21,000 acres by sale and 10,000 acres by exchange in Sheridan County. The resource area's total available for consideration is 73,000 acres for sale and 118,000 acres for exchange. The lands identified for possible sale also could be exchanged. If the planning criteria were met, the lands identified for exchange would not be available for sale during the life of this plan.

Lands identified as available for consideration for sale or exchange were selected according to the FLPMA disposal criteria. A site-specific analysis will be conducted for each possible sale or exchange so that existing resource values and conflicts can be identified. By regulation, parcels will not be disposed of if they contain any of the following resources: valid claims for locatable minerals, cultural sites that are potentially eligible for nomination to the National Register, riparian areas or wetlands, or threatened or endangered species habitat (where the species is known to be present).

Rationale: The disposal of land would provide for better management of the public lands in the resource area. Small parcels that are uneconomical

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to manage would be sold. Exchanges would create larger blocks of public lands that would be more economical to administer.

The possible sale of lands in areas of high mineral interest and development could increase the cost of producing the federal minerals because the new private surface owner could assess surface damage payments. Where coal is involved, a new owner, after meeting the requirements to become a qualified surface owner, might withhold consent to mine the federal coal; thus, it would not be available for leasing and development.

Other program decisions that apply to lands and realty management are CRM-2, RVRM-3, RVRM-4, RVRM-5, RVRM-6, SWAM-1, SWAM-2, SWAM-3, WHM-1, WHM-2, WHM-3, WHM-4, WHM-5, and WHM-7.

Minerals Management

Leasable Minerals

Coal

MM-1: Federal coal lands in central Campbell County and in north central Sheridan County, as shown on map 9, are available for new competitive coal leasing. The areas identified encompass about 454,000 acres containing about 32 billion tons of uncommitted federal coal after application of the coal screening process. This includes PRLAs (approximately 75,000 acres containing 6 billion tons) and delineated (but unleased) federal coal tracts (approximately 95,000 acres containing 6 billion tons).

Rationale: This alternative would allow new competitive leasing in areas that have the highest economic potential for development and that are best served by existing transport facilities. It would offer an amount of coal more than sufficient for competitive leasing over the next ten-year period.

MM-2: Uncommitted federal coal land within and outside the competitive leasing area (see MM-1, above) is available for noncompetitive leasing (for example, exchanges and lease modifications).

Rationale: Noncompetitive needs for coal may include various exchanges and lease modifications in the next ten years. Uncommitted federal coal land required to meet these noncompetitive needs will not be defined until an exchange right is established or a lease modification is required.

For this reason, no restriction is placed on non-competitive needs other than meeting those needs on uncommitted federal coal lands where the coal screening process has been applied.

MM-3: Lease federal oil and gas estates within federal coal leases case by case, subject to valid existing rights.

Rationale: Oil and gas reservations inside coal lease boundaries often are not contiguous to other federal oil and gas reservations. Development that could occur on private surface and minerals could drain federal oil and gas. Leasing the federal oil and gas would allow development inside the coal lease or adjacent to it with no subsequent loss of the federal oil and gas.

MM-4: Delineated coal tracts shown on map 9 are available for consideration for competitive leasing in one coal lease sale beginning with the second round Powder River lease sale. Tracts previously considered for leasing and newly delineated tracts would be available for consideration. Any coal tract not selected for inclusion in a lease sale or any tract included in a lease sale but not sold could be either redelineated or dropped from further consideration for sale.

Rationale: Tracts not sold after being considered in a leasing round may not be competitive for various reasons such as lower coal quality, environmental problems, or extensive requirements for transport facilities.

Oil and Gas

MM-5: Defer competitive and noncompetitive coal leasing in producing oil and gas fields unless or until coal development would not interfere with the economic recovery of the oil and gas resource, as determined case by case by the BLM.

About 175,000 acres containing about 20 billion tons of federal coal lie within KGSs. Oil and gas fields are defined in this plan by the boundaries of identified KGSs. The coal screening process has already been applied on federal coal lands in KGSs; therefore, it would be possible to lease coal in a KGS whenever the BLM determines that all or parts of a KGS are no longer required for oil and gas operations or that site-specific conflicts between oil and gas production and coal development could be mitigated.

The public would be invited to supply information regarding oil and gas operations during the formal call for expressions of interest in coal

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leasing. If the BLM should concur with the information indicating coal leasing would not interfere with recovery of the oil and gas in a KGS, then a coal tract could be delineated in the KGS and be considered further for coal leasing.

Before potential coal lease tracts in oil and gas fields could be delineated, the BLM site-specific analysis team would conduct a field review of possible lease tract areas, especially those in which high coal leasing interest had been expressed. Any new information gathered during the field review regarding oil and gas operations would be considered before coal tracts were delineated. This could result in KGS areas being made available for coal leasing or in new areas being deferred where conflicts exist.

Following tract delineation, any new oil and gas operations occurring within a coal tract or new oil and gas information regarding a tract would be analyzed during the coal activity planning process.

Rationale: The decision would maximize production of energy resources without developing one resource to the detriment of the other. The quantities of coal available for potential new leasing make it unnecessary to create unmitigable conflicts between coal and oil and gas production within the resource area. Case-by-case consideration would provide an opportunity for evaluation of the potential for development of the resource and would minimize conflicts.

MM-6: Lease for oil and gas development (only after congressional action not to designate as wilderness) 6,423 acres in the Gardner Mountain WSA, 10,089 acres in the North Fork WSA, and 12,419 acres in the Fortification Creek WSA with the terms and conditions shown on the Oil and Gas/Watershed and Oil and Gas/Wildlife maps for each WSA. The maps are in appendix 7.

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Rationale: Leasing these lands would help to maximize the acreage available for oil and gas leasing but recognizes and protects the sensitive environment in these areas.

Salable Minerals

MM-7: The entire resource area is available for mineral material sales upon application. Sites listed in appendix 4 under "Disposal Areas for Salable Minerals" are designated for specific mineral material disposals. Final decision comes with processing the application, which includes preparation of a site-specific EA. Findings of some EAs may result in denial of specific locations. Stipulations are attached to protect the environment and to ensure successful reclamation.

The use of mineral materials for road construction and maintenance by state and county highway departments will receive priority attention.

Rationale: Disposal of mineral materials from designated sites would reduce environmental impacts while maximizing public benefits realized from disposal of a limited commodity.

Other program decisions that apply to management of all minerals (coal, oil and gas, and salable minerals) are CRM-2, LR-4, RVRM-2, RVRM-3, RVRM-4, RVRM-5, RVRM-6, SWAM-1, SWAM-2, SWAM-3, WHM-1, WHM-2, WHM-3, WHM-4, WHM-5, and WHM-7.

Recreation and Visual Resource Management

RVRM-1: Public lands in Campbell and Sheridan counties are designated for ORV use as shown on table 2-3.

All public lands in Johnson County already have been designated as either open, closed, or available for limited ORV use. All designations will be evaluated continuously for effectiveness, and areas might be reclassified according to the BLM planning system or in response to resource-related problems.

Rationale: ORV designations are mandated by executive orders 11644 and 11989. Designations will help reduce resource damage such as soil disturbance, loss of vegetation, and disturbance of wildlife that can be caused by indiscriminate vehicle use on public land.

RVRM-2: Prohibit surface disturbance or occupancy on lands in the Red Wall/Hole-In-the-Wall area (shown on map 10) unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on the results of an evaluation of engineering drawings, if applicable, and a visual contrast rating. A waiver would be granted if it was determined that the action could occur without causing a significant visual impact in the area. The area on which no surface occupancy would be allowed is about 7,200 acres.

Rationale: This decision would protect the scenic quality of the Red Wall, which has been nominated as a national natural landmark.

RVRM-3: Prohibit surface disturbance or occupancy in the Middle Fork Canyon and within ½ mile of the canyon rim (shown on map 10) unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on the results of an evaluation of engineering drawings, if applicable, the location designation, and a visual contrast rating. A waiver would be granted if it was determined that the action could occur without causing significant adverse effects on visual resources, cultural resources, or wildlife. The area on which no surface occupancy would be allowed is 12,000 acres.

Rationale: Development activities would create a significant threat to cultural resources, the Middle Fork fishery, critical wildlife habitat, and canyon aesthetics.

RVRM-4: Prohibit surface disturbance or occupancy on North Middle Pumpkin Butte (shown on map 10) unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on the results of an evaluation of engineering drawings, if applicable, the location designation, and a visual contrast rating. A waiver would be granted if it was determined that the action could occur without causing a significant visual impact in the area.

Rationale: No surface development has occurred to date on this butte. This decision would preserve the visual integrity of this scenic landmark.

RVRM-5: Prohibit surface disturbance or occupancy on the Dry Creek Petrified Tree Environmental Education site (see map 3) unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would

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TABLE 2-3
PROPOSED OFF-ROAD VEHICLE DESIGNATIONS
FOR CAMPBELL AND SHERIDAN COUNTIES

	Acreage by County	Total Acreage
Open Areas		20,386
Closed Areas		3,650
Limited Areas A —Vehicle travel is permitted only on existing roads and vehicle routes:		
Campbell County	189,267	
Sheridan County	50,730	
Johnson County	326,187	
Total Limited Areas A		566,184
Limited Areas B —Vehicle travel is permitted only on roads and vehicle routes designated by BLM:		
Campbell County	46,800	
Sheridan County	0	
Johnson County	124,182	
Total Limited Areas B		170,982
Limited Areas C —Vehicle travel is limited to time or season of use:		
Campbell County	0	
Sheridan County	0	
Johnson County	37,646	
Total Limited Areas C		37,646
Total public lands in the three counties		798,848

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depend on the results of an evaluation of engineering drawings, if applicable, the location designation, and a visual contrast rating. A waiver would be granted if it was determined that the action could occur without causing a significant effect on the area's educational value.

Rationale: This decision would protect a 40-acre site that contains remnants of an ancient redwood forest.

RVRM-6: Prohibit surface disturbance or occupancy within 200 feet of the centerline of state and federal highways unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on the results of an evaluation of engineering drawings, if applicable, the location designation, and a visual contrast rating. A waiver would be granted if it was determined that public safety and visual resources would not be significantly affected.

Rationale: Establishment of a buffer zone would help reduce the safety and visual effects associated with BLM-related activities along heavily used public roads. Visual intrusions are extremely sensitive in high use areas such as highways.

RVRM-7: Provide access to the Gardner Mountain and North Fork WSAs by existing roadbed

and new construction. A road would be constructed to provide access from an existing county road to the vicinity of the present Gardner Mountain WSA. A parking area would be built on public land at the end of the road, and a horseback and hiking trail would lead from the parking area to the boundary of the present WSA and into the unit. One primitive campground would be developed in the vicinity and one inside the present WSA if anticipated demand should be realized.

A foot and horseback trail would be constructed for access to the present North Fork WSA. Trailhead parking would be provided on public land near a county road outside the unit. A primitive campground would be developed inside the present WSA if anticipated use should be realized.

Rationale: Providing access to these WSAs for public use would open two large blocks of public land for the first time. Both areas offer excellent opportunities for recreation and for experiencing solitude and naturalness.

Other program decisions that apply to recreation and visual resource management are CRM-2, LR-2, SWAM-1, SWAM-2, SWAM-3, WHM-1, WHM-2, WHM-3, WHM-4, WHM-5, and WHM-7.



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Soil, Water, and Air Management

SWAM-1: Prohibit surface disturbance or occupancy in areas of severe erosion hazard (see map 12) from March 1 through June 15 unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on weather conditions and visible moisture conditions of the soil such as potential for rutting. A waiver would be granted if the weather conditions were essentially dry and if it could be expected that only minor rutting would occur.

Rationale: Areas of severe erosion hazard are characterized by shallow, erosive, or fragile soils on moderate to steep slopes. Disturbance of these soils in spring, when the soil surface is saturated, greatly increases the potential for accelerated erosion.

SWAM-2: Prohibit surface disturbance or occupancy within 500 feet of any reservoir, well, or live or perennial stream unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on the location of the action in relation to the water; for example, on a terrace sloping away from the water or with a ridge between the disturbance and the water. A waiver would be granted if it was determined that siltation of the water would not occur.

Rationale: Requiring a buffer zone of at least 500 feet between the disturbance or facility and the water source would reduce the potential for accidental contamination of surface and subsurface water.

SWAM-3: Prohibit surface disturbance or occupancy on slopes of more than 25% (see map 12) unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on the results of an evaluation of engineering drawings (if applicable), mining plans, or plans of operation. A waiver would be granted if it was determined that the action could occur without significantly accelerating soil erosion.

Rationale: Surface disturbance of soils on slopes of more than 25% would result in accelerated soil erosion from the disturbed sites.

SWAM-4: Fence the head seepage areas of all spring developments on public surface. The exact area to be fenced would be determined after field inspection. The fences would normally enclose an area about 50 feet square. It is expected that the heads of six or seven spring developments would be fenced over the next ten years.



Rationale: Livestock and wildlife tend to concentrate in the spring seep areas, reducing water quality through siltation and damaging riparian vegetation by trampling. Fencing the seep areas would enhance water quality by reducing siltation and would reduce maintenance costs while increasing the useful life of the project.

Management of WSAs

WM-1: Recommend all three WSAs for non-designation as wilderness.

If this recommendation should be accepted by Congress, 28,931 acres would be available for full multiple use management. The specific management direction for each WSA is shown in appendix 7.

Rationale: The ecosystem of the North Fork and Gardner Mountain WSAs is already well represented in the National Wilderness Preservation System. Designation of these areas as wilder-

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ness would not contribute to balancing the geographic distribution of wilderness areas within the system. Energy resource values are high in the Fortification Creek WSA, and timber resource values are high in the North Fork WSA.

Wildlife Habitat Management

WHM-1: Prohibit surface disturbance and occupancy in the Ed O. Taylor, Kerns, Bud Love, and Amsden Creek big game ranges (see map 14) unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on the type of action proposed and the effect it would have on big game. A waiver would be granted if it was determined that no significant adverse effects on big game would occur.

These four big game ranges managed by the WGFD contain approximately 27,000 acres of federal minerals. All the ranges provide crucial winter and yearlong habitat for big game and important seasonal use areas for numerous small game and nongame species.

Rationale: Occupancy and disturbance of the surface would displace big game from crucial areas; consequently, herd health would be lowered because of stress. The result would be a corresponding loss in elk and deer numbers.

WHM-2: Prohibit surface disturbance in crucial big game winter range between November 30 and May 1, and in parturition areas between May 1 and June 30 (see map 14). In addition, prohibit surface occupancy in the parturition areas. The decision can be waived by the area manager. Whether or not the prohibition would be waived would depend on the type of action proposed, the exact location of the action, and the exact dates on which different phases of the action would occur. A waiver would be granted if it was determined that crucial habitat would not be significantly affected during important seasons.

To date, 106,000 acres have been identified as crucial elk and bighorn sheep winter range and 9,000 acres as elk calving and bighorn sheep lambing areas.

Rationale: These crucial seasonal use areas are limited by specific habitat characteristics. Elk and bighorn sheep are less tolerant of human activity than other big game species and will readily displace to lower quality areas away from human activity. As a result, herd health and reproduction would decline, resulting in lower herd numbers.

WHM-3: Prohibit surface disturbance and occupancy within 250 yards of sharp-tailed grouse dancing grounds at any time, and prohibit surface disturbance within an additional ½-mile radius of sharp-tailed grouse dancing grounds from April 1 through May 30 (see map 14) unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on the type of action, the exact location of the action within the boundaries of the designated areas, and the exact dates on which the different phases of the action would occur. A waiver would be granted if it was determined that crucial habitat would not be significantly affected during important seasons.

Currently, 240 acres have been identified for no surface occupancy at any time and 7,100 acres have been identified for the seasonal "no surface disturbance" limitation. The seasonal limitation does not apply to maintenance and operation of existing facilities.

Rationale: The "no surface occupancy" distance of 250 yards and the ½-mile seasonal buffer zone are minimal distances that would prevent breeding ground disruption and possible abandonment. Some human activities and facilities might have little impact on sharp-tailed grouse, depending on the location and the distance from breeding activity. Therefore, the restriction could be waived after field inspection.

WHM-4: Prohibit surface disturbance and occupancy within a ¼-mile radius of the center of sage grouse strutting grounds with no exceptions, and within an additional 1 ¼-mile radius from March 1 to June 15 (see map 14) unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend on the type of action, the exact location of the action within the designated areas, and the exact dates on which the different phases of an action would occur. A waiver would be granted if it was determined that crucial habitat would not be significantly affected during important seasons.

About 3,600 acres have been identified as "no surface occupancy" areas, and approximately 178,400 acres are affected by the seasonal "no surface disturbance" stipulation.

Rationale: The no surface occupancy and seasonal activity buffer zones correspond to recommendations from literature and scientific study. Although some studies have shown that surface-disturbing activity does not appear to affect breeding behavior of sage grouse in proximity to the lek center, documented evidence of

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lower productivity and abandonment of strutting grounds in the resource area has been attributed to human activity during this crucial period.

WFM-5: Prohibit surface disturbance or occupancy within a biologic buffer zone around active nests of high interest raptor species from March 1 through June 30 (see map 14) unless the prohibition is waived by the area manager. Whether or not the prohibition would be waived would depend

on the type of action, the exact location of the action within the biologic buffer zone, and the exact dates on which different phases of an action would occur. A waiver would be granted if it was determined that crucial habitat would not be significantly affected during important seasons.

Some species protected by buffer zones are golden eagles, bald eagles, peregrine falcons, prairie falcons, burrowing owl, ferruginous hawk,

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osprey, and merlin. Most buffer zones surrounding high-interest raptor nests encompass a radius of about $\frac{1}{2}$ mile; thus, approximately 100,000 acres are affected by this decision. Specific raptor nesting periods and buffer zones will be considered case by case.

Rationale: The period March 1 to June 30 corresponds with the approximate time of nest construction, egg laying, incubation, and fledging of raptor species. Continuous surface-disturbing activity can cause nest abandonment, especially during nest building and incubation. Raptor species often can tolerate nearby human activity when the activity is screened by vegetation or topography. For this reason, site-specific analysis is needed before any action takes place.

WHM-6: Develop HMPs to Improve and protect wildlife habitat in the following priority areas: South Big Horns HMP (1985), Including a portion or all of the Gardner Mountain and North Fork WSA; Wetlands and Aquatic HMP (1986); and Powder River Breaks HMP (1987).

The south Big Horns HMP area, which covers approximately 108,000 acres of public surface, is essential habitat for many wildlife species including elk, mule deer, antelope, mountain lion, small game, and nongame species.

The wetlands/aquatic HMP will be developed for the entire resource area to emphasize water quality and wetland, riparian, and fisheries habitat that is in less than satisfactory condition. Priority will be first, maintenance or improvement of 50 miles of streams in the south Big Horns; second, maintenance or improvement of riparian and wetland areas in less than good condition throughout the resource area.

The Powder River Breaks HMP would cover about 257,000 acres. The area contains important winter and yearlong range for elk, mule deer, and antelope, as well as habitat for numerous small game and nongame species.

All HMPs will be developed in cooperation with the WGFD under authority of the Sikes Act. Implementation of the HMPs would be coordinated with the development of the AMPs prepared for the "I" category allotments and with other activity plans.

Rationale: Crucial winter and yearlong habitat for elk and deer in the south Big Horns is limited by the availability of forage, cover, and water. Implementation of the HMP will improve these

habitat conditions and limit habitat degradation from timber harvesting, mineral development, livestock grazing, and recreational pursuits.

A wetland HMP is needed to maintain the streams or wetland areas on BLM-administered land that are now in good condition and to improve streams or wetland areas in less than satisfactory condition. Objectives would be to increase duck and goose production, to create additional fish habitat, and to improve habitat for all wildlife species that use wetland sites.

Present forage and water is limited in many areas in the Powder River Breaks. Implementation of the HMP will improve habitat conditions for all wildlife. Emphasis will be placed on meeting population objectives stated in the WGFD strategic plan.

WHM-7: Prohibit surface disturbance or occupancy within $\frac{1}{2}$ mile of communal winter roosts for bald eagles (see map 14), and prohibit surface disturbance within a biologic buffer zone around the roosts from November 1 through March 30. The prohibition can be waived by the area manager. Whether or not the prohibition would be waived would depend on the type of action, the exact location of the action within the boundaries of the biologic buffer zone, and the exact dates on which the different phases of the action would occur. A waiver would be granted if it was determined that crucial habitat would not be affected during the most important part of the season.

Buffer zones will be established on the basis of topography, vegetative screening, and essential foraging areas. A total of 500 acres will be affected by the "no surface occupancy" and approximately 1,400 more acres by the seasonal limitation.

Rationale: Bald eagles choose communal roost sites for specific habitat characteristics such as proximity to available food and aspect and density of conifer or deciduous trees, which afford protection from inclement weather. This endangered species will readily be displaced from an area by continuous surface-disturbing activity. This could cause them to expend more metabolic energy in search of food and thermal cover, with a resultant decline in reproduction.

Other program decisions that apply to wildlife habitat management are CRM-2, FM-3, GM-3, LR-4, RVRM-3, RVRM-4, RVRM-5, SWAM-1, SWAM-2, SWAM-3, and SWAM-4.

ALTERNATIVE C

Under Alternative C, environmental values would be protected to the extent required by applicable laws, regulations, and policies. The objective of this alternative is to address identified issues in a manner generally favoring economic production.

Should this alternative be selected as the final RMP, its decisions would supersede the planning decisions in the source documents listed in appendix 5. The site-specific mitigating measures identified in the source documents would be used as applicable following a site-specific analysis.

The management of the following programs would be the same under Alternative C as that described for Alternative B: fire management; forest management; lands and realty; oil and gas; salable minerals; soil, water, and air; and management of WSAs.

Management of cultural resource under Alternative C would be the same as under Alternative B, except that no CRMPs would be written.

The management of recreation and visual resources would be the same as that described for Alternative B, except that decisions RVRM-4 and RVRM-6 would not be included.

Bold type in the following sections indicates the decisions that would be carried out under Alternative C.

Grazing Management

Decisions GM-1 (noxious weed control), GM-2 (management of "M" allotments), and GM-4 (management of "C" allotments) would be implemented under this alternative.

GM-3: Manage "I" category allotments as described below.

Conduct baseline inventories. The inventories are needed to update information on range sites and range condition. Through the baseline inventories, which would include ranch unit analysis, objectives would be established and opportunities for improved resource management identified.

Develop, Implement, and monitor AMPs. The AMPs would call for implementation of various grazing systems, along with range improvement projects. Proposed range improvements are listed in table 2-1, in the "Alternative B" section of this chapter. Guidelines for development of improvements appear in appendix 4.

It is estimated that 10 to 12 AMPs would be developed and fully implemented over the ten-year life of this plan. All 29 AMPs would be implemented in approximately 30 years. Livestock grazing is expected to increase from 28,968 AUMs to 32,818 AUMs by the end of the first ten years of the plan. In the long term (40 to 50 years), authorized livestock grazing would be increased to 44,368 AUMs. Livestock numbers, kinds, and period of use would continue as now licensed (see appendix 6) pending adjustments made in conjunction with implementation of AMPs or on the basis of analysis of data from studies.

The priority for development of AMPs was established through application and evaluation of an allotment categorization criteria (appendix 3). Highest priority allotments for AMP development were those that offered the greatest potential for improvement of unsatisfactory range condition, management, or resource conditions and those that offered the best return on public investments.

Resource monitoring studies covering actual use, forage utilization, trend, and climate would be established in conjunction with implementation of the AMPs. Studies would be conducted according to methodology established in a resource monitoring plan to be developed after this RMP is completed. The monitoring plan will follow guidance established in BLM instruction memos 82-292 and 82-330 and in sections of the *BLM Manual*.

License new forage produced through implementation of AMPs to livestock after range condition class is upgraded to "good." None of the new forage would be reserved for big game use; however, before livestock use would be increased by 15,400 "new" AUMs, allotment-specific resource management objectives would be met by the improved range conditions. Generally, these objectives would include eliminating any accelerated soil erosion and stabilizing watersheds.

Rationale: This alternative would address the issue of unsatisfactory range condition. Adequate forage would be maintained at present levels to sustain current populations of big game.

Minerals Management

Coal-related decisions MM-3 and MM-4 from Alternative B would be implemented under Alternative C.

MM-1: Federal coal lands shown on map 9 are available for new competitive and noncompetitive leasing. This alternative includes all uncommitted

Alternatives

federal coal land available for further consideration for leasing after application of the coal screening process. This amounts to 1,823,000 acres containing 100 billion tons, including PRLAs (75,000 acres containing 6 billion tons) and coal tracts now delineated (95,000 acres containing 6 billion tons).

Rationale: This alternative would make all uncommitted federal coal land available for competitive leasing, so that any foreseeable demand for coal would be met and the availability of federal coal lands for competitive and noncompetitive leasing would be maximized.

Wildlife Habitat Management

WHM-1: Prohibit surface disturbance in crucial big game winter ranges between November 30 and May 1 and in parturition areas between May 1 and June 30 unless the decision is waived by the area manager. Whether or not the prohibition would be waived would depend on the type of action, the exact location of the action within the boundaries of the designated areas, and the exact dates on which the different phases of the action would take place. A waiver would be granted if it was determined that crucial habitat would not be significantly affected during the most important season. This would depend somewhat on the location of the action.

This decision would prevent new surface-disturbing activities during the crucial big game winter and birthing periods. Surface occupancy and the operation and maintenance of existing facilities would be permitted.

Rationale: This alternative would prevent disturbance of the surface from displacing big game from crucial areas, which could lower herd health because of stress, causing a corresponding decrease in elk and deer populations.

WHM-2: Prohibit surface-disturbing activity within a biologic buffer zone around communal roosts for bald eagles from November 1 to March 30 (see map 14). This decision would protect bald eagles during the winter roosting period; however, it would not prevent construction of facilities within $\frac{1}{2}$ mile of the roosts after March 30. Any construction within the $\frac{1}{2}$ -mile buffer after March 30 would require consultation between the BLM and the USFWS.

Rationale: A buffer zone would protect the bald eagles at their historically used winter roost sites.

WHM-3: Prohibit surface disturbance within a $\frac{1}{2}$ -mile radius of sharp-tailed grouse dancing grounds from April 1 to May 30 (see map 14). This decision would eliminate the restriction prohibiting surface occupancy at any time within 250 yards of sharp-tailed grouse leks. Therefore, construction of facilities within 250 yards of the leks would be allowed.

Rationale: This decision would prevent disruption of breeding behavior by surface-disturbing activities.

ALTERNATIVE D

Alternative D places primary emphasis on environmental protection. The objective of this alternative is to change present management direction to address the identified issues in a manner that generally would place highest priority on the maintenance or improvement of environmental quality.

Should this alternative be selected as the final RMP, its decisions would supersede the planning decisions in the source documents listed in appendix 5. The site-specific mitigating measures identified in the source documents would be used as applicable following a site-specific analysis.

The management of the following programs would be the same as that described for Alternative B: cultural resources; coal; salable minerals; soil, water, and air management; and wildlife habitat management.

Fire suppression would be the same as that described for Alternative B, except that the interim fire management plans for the three WSAs would be adopted as wilderness area fire management plans.

Forest Management

Decisions FOM-1, FOM-2, FOM-5, and FOM-6 from Alternative B would be implemented under this alternative.

FOM-3: No forest products will be offered for sale from woodlands unless necessary to control insects and disease.

Rationale: Woodlands would be preserved for wildlife habitat, aesthetic values, and watershed protection.

Alternatives



FOM-4: Offer for sale approximately 7 MMBF of sawtimber from 1985 through 1994 from the following priority timber harvest areas:

Gardner Mountain area (not in WSA), 500 MBF
Baldwin Creek, 500 MBF
Poison Creek, 1 MMBF
Horn, 2 MMBF
Red Springs Reservoir, 250 MBF
Arndt, 500 MBF
Lost Creek, 250 MBF
Upper North Fork Reentry, 250 MBF
Lower Beartrap, 1 MMBF
Billy Creek, 250 MBF
Lower "H" Hill, 500 MBF

North Fork and Gardner Mountain would be recommended for wilderness designation. Designation would reduce the harvest base; therefore, the total allowable cut for the resource area would have to be reduced. The commercial forestlands in the North Fork and Gardner Mountain WSAs contain approximately 18% of the total volume of BLM-administered sawtimber in the resource area.

The harvest level of 7 MMBF proposed by this alternative represents a 2 MMBF reduction from the preferred level. Sales would be offered in the

identified areas, but the schedule allows flexibility in annual proposed offerings should such action be warranted because of delays in acquiring easements or changes in biological or economic conditions that influence the management of forestlands. Final decisions regarding which sales to offer in any particular year will be made after interdisciplinary review.

Grazing Management

Decisions GM-1, GM-2, and GM-4 from Alternative B would be implemented under this alternative.

GM-3: Manage "I" category allotments as described below.

Conduct baseline Inventories. Inventories are needed to update information on range sites and condition. Site-specific resource management objectives would be established and opportunities identified through these inventories, which would include ranch unit analysis. Additional resource monitoring studies consisting of actual use, forage utilization, range condition trend, and climate would be established.

Alternatives

Reduce licensed livestock grazing to allow recovery and maintenance of range condition to "good" or "excellent" on 29 "I" allotments. The proposed reduction is 8,800 AUMs (30%) fewer than the current authorized level of 28,968 AUMs.

Livestock reductions would be implemented over a five-year period beginning in 1986. Following analysis of inventory and monitoring studies, livestock use adjustment would be implemented in accordance with current grazing management regulations (43 CFR 4110.3-2). Range improvements would be the same as those described for Alternative A ("no action").

The exact level of reduction proposed for individual allotments would depend on the results of site-specific allotment inventories and monitoring studies. However, it is expected that the proposed reduction would range from 10 to 50% of the current level of authorized use on an individual allotment.

These relatively high rates of reduction would be necessary not so much because the allotments as a whole are overstocked as because the distribution of use is uneven. Without construction of additional management facilities, particularly water developments and cross fences, the recommended stocking rates would have to be adjusted to a level that would ensure that natural concentration areas such as bottomland would not be overused.

After range condition class is upgraded to "good," continue allocation of AUMs to wildlife to meet the WGFD's population objectives.

Long-term authorized livestock grazing would be 28,568 AUMs. This restoration of 6,400 AUMs for livestock use would be implemented after the resource management objectives for the individual allotments had been met; that is, when range condition was satisfactory and watershed condition was stable. However, there would be a permanent forage reserve totaling 2,400 AUMs on 23 of the "I" allotments. This represents the estimated forage demand necessary to sustain the WGFD's objective for the population level of big game on those allotments.

Rationale: The practices described would address the issue of unsatisfactory range condition and lack of wildlife forage by reducing livestock grazing use in 29 "I" allotments to improve range condition.

GM-5: Use natural materials in the construction of new range improvement projects in the WSAs. Prohibit the use of motorized vehicles except when approved case by case for emergencies such as removal of sick animals, or where no alternative method of transportation was available for maintaining existing range improvement projects.

Authorization of livestock use would continue at current levels on allotments that are partially or totally within the WSAs. Range improvements would be maintained by the individual grazing lessees under cooperative agreements or permits (see appendix 7).

Lands and Realty Management

LR-4: The lands and realty program under Alternative D would be the same as that described for Alternative B, (decisions LR-1, LR-2, and LR-3 would be implemented) except that the lands shown on map 7 are available for further consideration for disposal. (Mineral resource values would not preclude disposal.)

Rationale: This decision would provide for adjusting the surface ownership pattern to deal with the difficulty of economically managing scattered parcels of public land.

Minerals Management

MM-6: Manage oil and gas under Alternative D as described for Alternative B, except that oil and gas in the WSAs is not to be leased without congressional approval. The WSAs total 28,931 acres. Congressional approval would be sought to lease oil and gas within the WSAs with a "no surface occupancy" stipulation.

Rationale: Should congressional approval be obtained, there would be no opportunity for a waiver of the "no surface occupancy" requirement. The land surface would be protected from any impairment.

Rationale: Not leasing the WSAs would be in compliance with congressional direction. Obtaining congressional approval of leasing within $\frac{1}{2}$ mile of the boundaries would protect the wilderness characteristics of the areas while accommodating oil and gas exploration and development, and it would prevent drainage of federal minerals from adjacent areas with privately owned minerals.

Alternatives

Recreation and Visual Resource Management

RVRM-7: Manage recreation resources as described for Alternative B, with the exception of the recreation resources in the wilderness study areas.

Under this alternative, access to the Gardner Mountain WSA would be similar to that described for Alternative B. Visitor facilities such as a parking area and a primitive campground would be developed if needed on public land near Gardner Mountain, outside the WSA boundaries.

Access to the North Fork WSA would be similar to that described for Alternative B. The unit would be managed to provide a primitive setting and to allow nonmotorized recreational pursuits.

No access would be provided to the Fortification Creek WSA, and no recreational or support facilities would be developed.

Management of WSAs

WM-1: Recommend all three WSAs as suitable for wilderness designation. If Congress should decide to accept the recommendation and designate the WSAs as wilderness, they would then be managed according to the BLM's wilderness management policy. Appendix 7 contains more specific management direction.

Rationale: Wilderness designation of the three WSAs would add 28,931 acres to the National Wilderness Preservation System (NWPS). Designation of the Fortification Creek WSA would add 12,419 acres of an ecosystem not now represented in the NWPS.

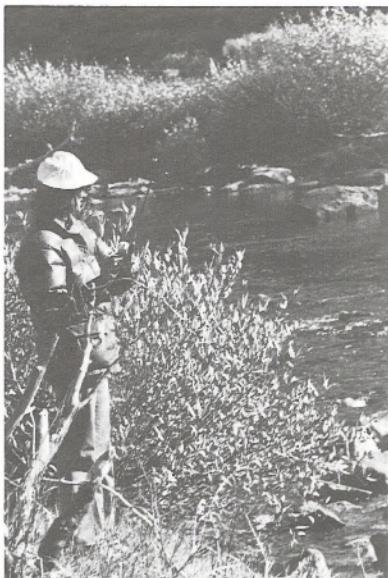


Table 2-4 contains a summary comparison of the environmental consequences of the alternatives. Environmental consequences are discussed in detail by alternative in chapter 4.

TABLE 2-4
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Alternative A	Alternative B	Alternative C	Alternative D
AIR RESOURCES			
Localized short-term fugitive dust.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
CULTURAL RESOURCES			
Protection of known cultural sites on 69,720 acres (est.). Low probability of damaging or destroying the sites. Additional data would be acquired through surveys.	Protection of known cultural sites on 4,360 acres. Acreage reduced because inventories that have been conducted. Slight probability of damaging or destroying sites. Public benefit provided by planning and interpreting two sites and one archeological district. Additional data would be acquired through surveys.	Same as Alternative B, except no public benefit would be derived from interpretation of sites.	Same as Alternative B.
LAND USES			
Forestry			
Approximately 1.5 MMBF of green and dead timber would not be harvested from woodlands. Productive capability of small areas of commercial forestland impaired by livestock use.	Approximately 11 MMBF of green timber and 1.5 MMBF of dead timber would be offered for sale. Production capability would be increased by prescribed burning and livestock removal in some areas. Approximately 3,650 acres would be recommended for return to full multiple use with a "no wilderness" recommendation.	Same as Alternative B.	Approximately 7 MMBF of green timber would be offered for sale. Production capability would be increased by prescribed burning and livestock removal from some areas. Approximately 3,600 acres would be removed from the allowable cut base because of recommendation for wilderness designation.
Grazing			
Condition of approximately 161,000 acres of rangeland on "I" allotments would remain less than satisfactory. Control of wildfire, weeds, and grasshoppers would increase forage production approximately 100 AUMs maximum. Mineral development, right-of-way construction, and range improvement	Condition of approximately 113,000 acres of rangeland would be less than good in the short term; 84,000 acres would be less than good in the long term. Approximately 5,000 AUMs would be lost in the short term from surface disturbance associated with grazing and lands and mining.	Same as Alternative B, except a short-term increase of approximately 3,850 AUMs on approximately 130,000 acres from improved range condition on approximately 10 to 12 allotments; long-term increase of approximately 15,400 AUMs on 272,292 acres on 30 to 35 allotments.	Same as Alternative B, except for short-term loss of livestock forage of approximately 9,900 AUMs. Long-term reduction would be approximately 2,780 AUMs.

Alternatives

SUMMARY OF ENVIRONMENTAL CONSEQUENCES (continued)

Alternative A	Alternative B	Alternative C	Alternative D
<p>construction would cause a reduction of approximately 150 AUMs per year.</p> <p>erals (approximately 1,100 AUMs on 7,000 acres on public surface).</p> <p>Approximately 1,100 AUMs would be lost on approximately 8,300 acres (380 AUMs on 2,000 acres on public surface) resulting from long-term uses.</p> <p>Short-term increase of approximately 3,250 AUMs on approximately 130,000 acres from improved range condition on approximately 10 to 12 allotments. Long-term increase of approximately 13,000 AUMs on approximately 272,300 acres on 30 to 35 allotments.</p>			
<p>Lands and Realty</p> <p>Surface ownership adjustments would eliminate scattered parcels and provide consolidated blocks of land, but only in Campbell County. Seasonal use restrictions prevent land use during specified times of year on approximately 724,000 acres. Avoiding approximately 70,000 acres of cultural sites and 8,000 acres of wildlife habitat could cause additional expenses to the grantees.</p>	<p>Surface ownership adjustments would eliminate scattered parcels and provide consolidated blocks of land in entire resource area. Seasonal use restrictions prevent land use during specified times of year on approximately 724,000 acres. Avoiding approximately 8,000 acres of wildlife habitat could cause additional expenses to the grantees.</p>	<p>Same as Alternative B.</p>	<p>Same as Alternative B.</p>
<p>Recreation</p> <p>Degradation in quality and reduction in diversity of recreational settings. Recreation use in the WSAs would remain static at 1,500 visitor days per year. Land sales would cause a reduction in resource base. Coal development would double demand for recreation.</p>	<p>Same as Alternative A, except that development of public access to the Gardner Mountain and North Fork areas would open approximately 51,000 acres of public land for recreation. ORV designation in Campbell and Sheridan counties would slightly reduce recreational opportunities because limited use restrictions would be applied.</p>	<p>Same as Alternative B.</p>	<p>Same as Alternative B, except that primitive recreation opportunities would be preserved on the 28,931 acres in the three WSAs.</p>

Alternatives

SUMMARY OF ENVIRONMENTAL CONSEQUENCES (continued)

Alternative A	Alternative B	Alternative C	Alternative D
MINERAL RESOURCES			
Coal			
Approximately 62 billion tons of coal would be available for leasing consideration. Deferment of coal leasing in KGSSs would be beneficial in that one energy resource would not be developed to the detriment of another.	Approximately 32 billion tons of coal would be available for new leasing consideration. Confinement of coal development to central Campbell and north central Sheridan counties should ensure an adequate supply of uncommitted coal and also would allow for consideration of potential environmental problems.	Approximately 103 billion tons of coal would be available for consideration for future competitive leasing.	Same as Alt. B.
Oil and Gas			
Added operation expenses would be caused by various restrictions and requirements. Approximately 514,000 acres could not be occupied by oil and gas development activities. Seasonal restrictions would prevent land use during certain times of the year on approximately 2,156,700 acres.	Added operating expenses would be caused by various restrictions and requirements. Approximately 351,000 acres could not be occupied by oil and gas activities. Seasonal restrictions would prevent land uses during certain times of the year on approximately 2,210,000 acres.	Same as Alternative B.	Same as Alternative B, except that case-by-case consideration of land disposals could increase expenses for surface damage fees paid to new owners. Potential for wells on private minerals adjacent to WSAs to drain federal oil and gas reserves under approximately 1,200 acres in WSAs within $\frac{1}{2}$ mile of private wells.
Salable Minerals			
Approximately 435,000 tons of federally reserved scoria and sand and gravel would be utilized.	Same as Alternative A.	Same as Alternative A.	Same as Alternative A.
SOIL RESOURCES			
Approximately 16,800 acres of soils would be mixed, disturbed, or exposed to erosion by timber production, right-of-way construction,	Same as Alternative A, except that accelerated erosion would be reduced on approximately 40,000 acres.	Same as Alternative A.	Same as Alternative A, except that erosion susceptibility would be reduced on approximately 30,000 acres

Alternatives

SUMMARY OF ENVIRONMENTAL CONSEQUENCES (continued)

Alternative A	Alternative B	Alternative C	Alternative D
<p>and mineral development in the short term. Approximately 5,000 acres of soil would be so affected and would be subject to long-term uses as a result of range improvements, oil and gas roads, and production facilities.</p> <p>Topography</p> <p>Slight lowering of elevation on coal mined areas.</p>			<p>because of improved range condition. Wilderness designation would prevent surface disturbance of soils on 28,931 acres.</p>
<p>VEGETATION</p> <p>Approximately 36,800 acres of vegetation would be removed or disturbed in the short term. In the long term, approximately 5,500 acres would remain unvegetated.</p>	<p>Same as Alternative A.</p>	<p>Same as Alternative A.</p>	<p>Same as Alternative A.</p>
<p>VISUAL RESOURCES</p> <p>Visual quality would be reduced in the short term on approximately 34,700 acres by surface disturbing activities.</p>	<p>Same as Alternative A, except ORV impacts would be reduced on approximately 300 acres, and about 500 more acres of timber would be harvested.</p>	<p>Same as Alternative B, except that visual quality would be reduced on North Middle Pumpkin Butte and along state and federal highways by surface disturbance.</p>	<p>Same as Alternative A, except wilderness designation would provide 28,931 acres where no visual degradation would occur—a protection not provided by any other alternative.</p>
<p>WATER RESOURCES</p> <p>Water yield would be increased 5 to 15% by timber harvest. Sedimentation would increase in perennial streams. Surface disturbance would cause localized sedimentation. Rupture of petroleum pipelines could cause contamination of surface water. Improperly plugged drill holes would degrade the subsurface water quality. Aquifers within a 2 to 3 mile radius of</p>	<p>Same as Alternative A, except minor localized short term increase in sedimentation from erosion on approximately 2,200 acres of prescribed burns and limited fire suppression areas. Improvement of range condition and fencing water developments would result in long-term localized improvement in water quality on approximately 40,000 acres.</p>	<p>Same as Alternative B.</p>	<p>Same as Alternative B, except potential for accelerated erosion would be reduced on approximately 30,000 acres through reduction in livestock grazing. Wilderness designation would prevent surface disturbance, and consequently sedimentation, on 28,931 acres—a protection not</p>

Alternatives

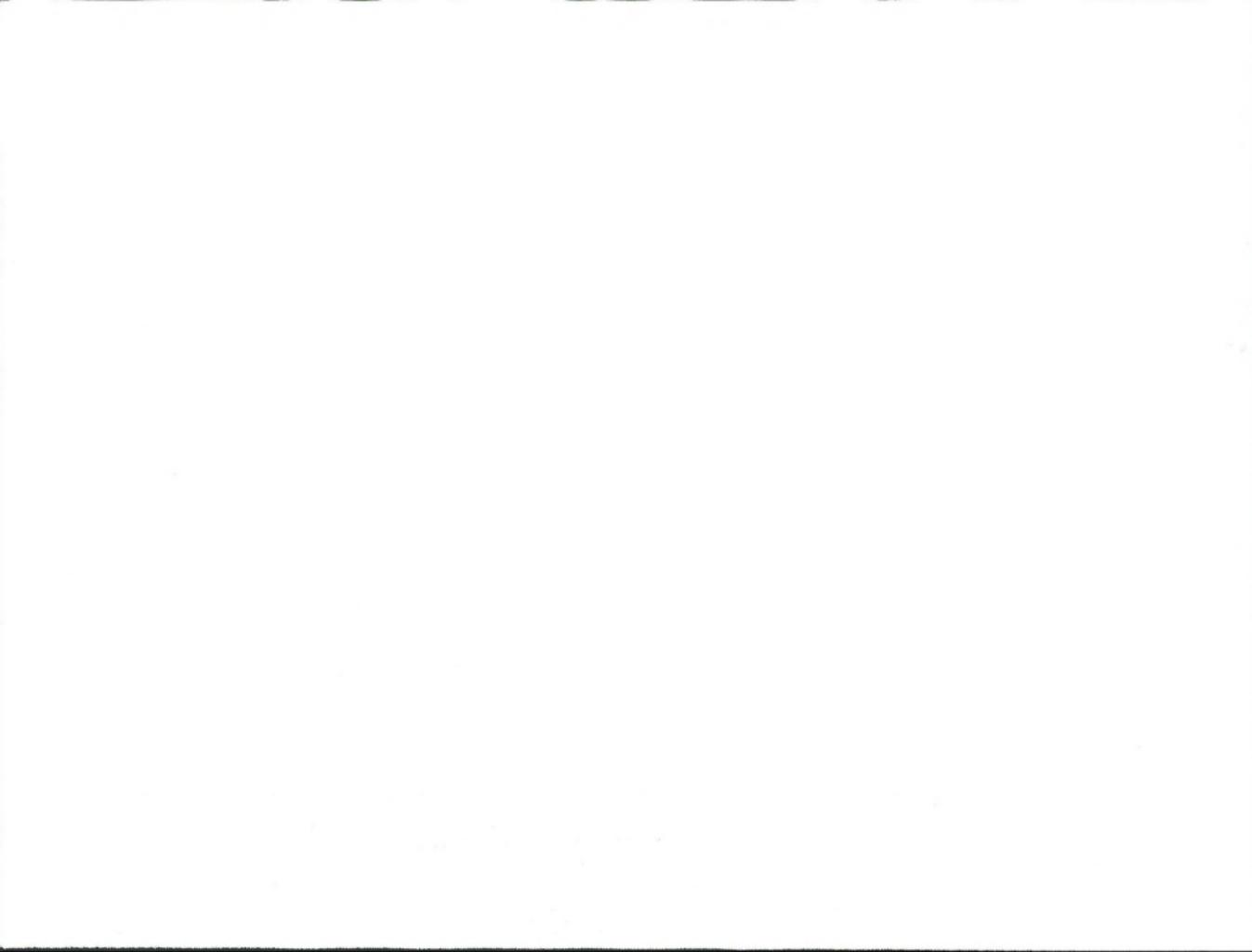
SUMMARY OF ENVIRONMENTAL CONSEQUENCES (continued)

Alternative A	Alternative B	Alternative C	Alternative D
coal mines would be removed or modified.			provided by any other alternative.
WILDERNESS			
Use of mechanized equipment for emergency fire suppression would alter the natural setting in WSAs in the long term.	Timber harvest on approximately 650 acres of commercial forests would result in long-term reduction of size, naturalness, opportunities for solitude and primitive recreation in the Gardner Mountain and North Fork WSAs. Oil and gas activities would have a similar effect in the Fortification Creek area on 12,419 acres. Diversity of natural system in NWPS would not be expanded.	Same as Alternative B.	The diversity of the natural system within the NWPS would be expanded by the addition of the Fortification Creek wilderness area. Opportunity for primitive recreation from three major population centers would be increased.
WILDLIFE HABITAT			
Slight long-term loss of wildlife habitat resulting from combined effects of less than desirable range and riparian habitat condition, timber harvest, oil and gas exploration/development, road and right-of-way construction, and ORV use. Wildlife numbers and species diversity would decline slightly.	Wildlife would be disturbed or displaced on approximately 20,000 acres in the long term through habitat destruction by oil and gas development, timber harvest, mineral material disposal, ORV use, and road and right-of-way construction. Prescribed burning would improve habitat diversity and increase edge effect on approximately 1,500 acres. Application of seasonal restrictions would prevent disturbance of wildlife during critical winter and parturition periods. Implementation of HMPs would maintain satisfactory habitat or improve unsatisfactory habitat through construction of wildlife improvements. Range condition on approximately 16,000 acres of critical elk winter range would im-	Big game population objectives established by the WGFID would not be met. Elk numbers would be reduced in the long term because new forage would be allocated first to livestock on approximately 10,000 acres of crucial elk winter range. Removal of surface occupancy and disturbance restrictions would cause long-term reduction in big game, grouse, and bald eagles.	Same as Alternative B, except approximately 6,400 AUMs of forage available in the short term would allow big game populations to increase to the WGFID objective level. Wilderness designation would provide a long-term benefit to wildlife by excluding surface disturbance activities. Big game habitat in the Fortification Creek wilderness area would be maintained.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES (continued)

Alternative A	Alternative B	Alternative C	Alternative D
prove from poor and fair condition to good condition in the long term.			
Approximately 2,400 AUMs of forage would be available to meet WGFD wildlife population goals in the long term. Riparian habitat conditions would improve in the long term on approximately 3 miles of perennial stream.			
SOCIOECONOMIC CONDITIONS			
Population in 1990			
Campbell County	54,700	Same as Alternative A.	Same as Alternative A.
Johnson County	8,400	Same as Alternative A.	Same as Alternative A.
Sheridan County	40,300	Same as Alternative A.	Same as Alternative A.
Agricultural Economics			
Estimated return per AU after operating cost in Johnson County			
75-cow enterprise	\$102.00	\$105.25	\$105.61
400-cow enterprise	113.50	113.60	113.62
1,000-cow enterprise	115.01	115.03	115.03
Cost Benefit Ratio	0.14:1	1.05:1	0.94:1
			0.54:1

NOTE: Short-term effects are those lasting ten years or less; long-term effects are those that would extend beyond the ten-year life of this plan.



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Chapter Three

The Affected Environment



THE AFFECTED ENVIRONMENT

BACKGROUND

SETTING

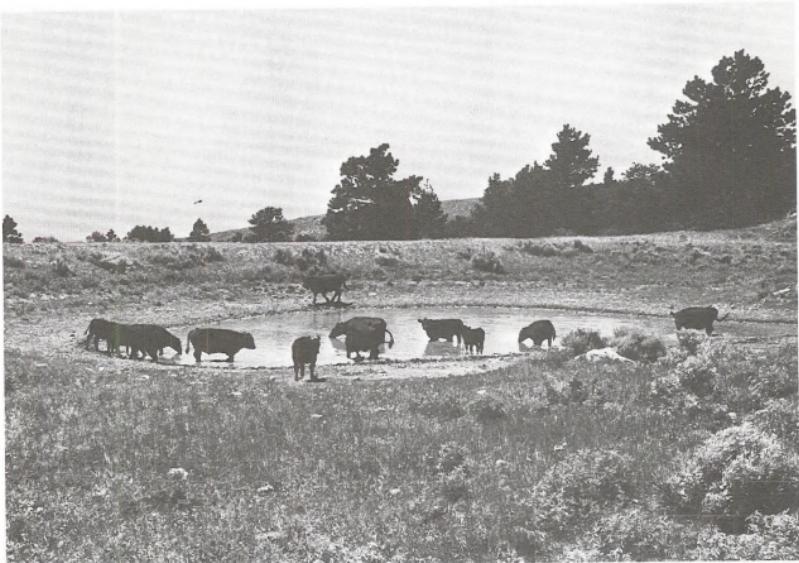
The Buffalo Resource Area comprises 798,848 acres of BLM-managed public land surface and 4,733,384 acres of federal mineral estate in Johnson, Sheridan, and Campbell counties in north central Wyoming. Gillette, Sheridan, and Buffalo are the principal cities. Notable topographic features are the Big Horn Mountains, the Powder River, the Powder River Breaks, Pumpkin Buttes, Rochelle Hills, and the Middle Fork Canyon and North Fork Canyon of the Powder River.

Most of the resource area has a semi-arid continental climate characterized by extreme yearly, seasonal, and daily fluctuations of weather. Precipitation ranges from 10 to 14 inches in the eastern plains and Powder River Breaks to 15 to 19 inches in the south Big Horn Mountains.

The area's economy is sustained by energy-related industry concentrated in Campbell and northern Sheridan counties and by an areawide agriculture industry dominated by livestock production.

INTRODUCTION

This chapter contains a description of the existing physical, biological, and socioeconomic characteristics of the resource area that would be affected by addressing the issues presented in chapter 1. This description of the affected environment serves as a baseline for analyzing and determining the effects of the various alternatives on resources.



Affected Environment

RESOURCES AND USES

AIR RESOURCES

Air Quality Standards

The basic regulatory framework of the Clean Air Act of 1977 involves national ambient air quality standards (NAAQS) and allowable increments for the prevention of significant deterioration (PSD) of air quality.

NAAQS are absolute nationwide limits on the amounts of certain pollutants that may be present in the air. No part of the country may exceed these levels. The federal government has set primary standards to protect public health and secondary standards to protect the general public welfare. Wyoming has set its own ambient standards for the same pollutants and for some others. Those standards are at least as stringent as federal standards (see table 3-1).

TABLE 3-1
WYOMING AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Contaminants	Wyoming Standards (mcg/m ³)	National Standards (mcg/m ³)	Primary	Secondary
Total suspended particulates (TSP)				
24-hour ^a	150	260		150
Annual ^b	60	75		60
Sulfur dioxide (SO ₂)				
3-hour ^a	1,300		--	1,300
24-hour ^a	260	365		--
Annual ^c	60	80		--
Nitrogen dioxide (NO ₂)				
Annual ^c	100	100		100
Carbon monoxide (CO)				
1-hour ^a	40,000	40,000		40,000
8-hour ^a	10,000	10,000		10,000
Hydrogen sulfide (H ₂ S) ^d				
0.5-hour ^e	70		--	--
0.5-hour ^f	40		--	--
Hydrogen fluoride (HF) ^d				
24-hour	0.8		--	--
Photochemical oxidants (O ₃)				
1-hour	160	235		235
Volatile organic carbons (Nonmethane) ^g				
3-hour ^a	160		--	--
Lead				
3-month	1.5	1.5		1.5

SOURCE: Riley Ridge Air Quality Technical Report.

NOTE: Temporary construction-related emissions, as well as the more permanent operations-related impacts, are subject to National Ambient Air Quality Standards and Wyoming Ambient Air Quality Standards. However, emissions resulting from emergency upsets and start-up and shut-down activities are exempted from NAAQS and WAAQS compliance.

- a. Not to be exceeded more than once per year.
- b. Annual geometric mean, never to be exceeded.
- c. Annual arithmetic mean, never to be exceeded.
- d. Wyoming ambient standard only.
- e. Not to be exceeded more than twice per year.
- f. Not to be exceeded more than twice in any five consecutive days.
- g. Wyoming ambient standard. Federal hydrocarbon standard was repealed by EPA on January 5, 1983.

Affected Environment

The PSD program is designed to protect the air quality from significant deterioration in areas already meeting the NAAQS. In other words, in cleaner areas a specific increase, or "increment," in pollution is allowed above the existing "baseline" pollution levels. In no event, however, may pollution increases exceed the NAAQS.

The size of increment allowable under the PSD program depends on the area's designation as a Class I, II, or III area, with Class I areas allowed the smallest pollution increment and Class III the largest. In the Clean Air Act of 1977, the Congress designated certain national parks and other such areas as Class I areas. All other areas were designated as Class II. However, Congress provided a procedure for state and tribal governments to redesignate areas under their jurisdiction as Class II or III.

Wyoming's PSD standards are identical to the federal standards (see table 3-2).

TABLE 3-2

MAXIMUM ALLOWABLE INCREASES FOR PREVENTION
OF SIGNIFICANT DETERIORATION OF AIR QUALITY

Pollutant	Averaging Time	Maximum Allowable Air Quality Increases (micrograms per cubic meter)		
		Class I	Class II	Class III
Sulfur dioxide	Annual mean	2	20	40
	24-hour ¹	5	91	182
	3-hour ¹	25	512	700
Total suspended particulates (TSP)	Annual mean	5	19	37
	24-hour ¹	10	37	75

NOTE: These are federal and Wyoming ambient air quality standards.

¹The increments for these averaging times are not to be exceeded more than once per year.

Air Quality in This Region

A report prepared by PEDCo Environmental, Inc. (1983a) contains a detailed description of the air quality in the region. Most of the region is federal Class II for PSD.

The maximum allowable increases in the federal and Wyoming ambient air quality standards are shown on tables 3-1 and 3-2. State standards for ambient total suspended particulates (TSP) generally are more restrictive than the federal standards, with 24-hour standards being a greater restraint than annual standards.

The background rural TSP annual geometric mean concentration for the region is about 15 micrograms per cubic meter. In and near populated areas and mining activities, particulate levels are significantly higher than background levels (see table 3-3).

TABLE 3-3
AMBIENT BACKGROUND CONCENTRATIONS OF POLLUTANTS IN THE POWDER RIVER REGION

Pollutant	Concentrations In micrograms per cubic meter
Sulfur dioxide	
Maximum annual arithmetic mean	1
24-hour maximum	9
3-hour maximum ¹	27
1-hour maximum	82
Total suspended particulates	
Maximum annual geometric mean	15
24-hour maximum	61.5
Nitrogen dioxide	
Maximum annual arithmetic mean	2
24-hour maximum	9

SOURCE: Figures for background concentrations supplied by the state of Wyoming.

¹Estimate based on rough interpolation between 1-hour and 24-hour maximum; no monitoring data are available for the 3-hour maximum.

No monitored violations of federal ambient TSP standards have occurred in Wyoming in recent years. However, the more restrictive Wyoming annual standard has been violated in Sheridan, and the 24-hour state standard has been marginally violated near several mining locations. Monitoring of gaseous pollutants indicated that concentrations are well within state and federal standards.

Air quality monitoring information shows that rural background concentrations of sulfur dioxide and nitrogen are as follows:

Annual arithmetic mean: sulfur dioxide, 1 microgram per cubic meter; nitrogen oxide, 2 micrograms per cubic meter.

Maximum 24-hour: sulfur dioxide and nitrogen oxide, 9 micrograms per cubic meter.

Visibility for more than 60 miles is common. Significant reductions in visibility are generally weather-related.

Affected Environment

Air Quality Management

The Buffalo Resource Area does not have an ongoing air resource management program. However, the goal of the air quality management within the state is to support local efforts to maintain or improve air quality.

CULTURAL RESOURCES

Cultural Sites In the Buffalo Resource Area

Areawide Cultural Sites

Cultural inventories in the Buffalo Resource Area for site occurrence have been accomplished on approximately 3% of the total resource area. This includes Class I, II, and III studies.

A total of 3,297 sites on federal surface or associated with federal minerals have been found on the approximately 142,000 acres that have been inventoried for cultural resources. Approximately 17% of all the sites that have been located are considered potentially eligible for the National Register of Historic Places.

These sites are distributed according to environmental zones and topographic features. Sites in each zone are ordinarily found in coordination with permanent water, ridgetops (like Indian Butte and Pumpkin Buttes), and multiple vegetation areas. However, site density figures cannot be accurately projected since precise and complete information is not available.

Site densities, as inferred from a sampling inventory of Sheridan and Johnson counties, might average 1.6 sites per square mile in these two counties (Reher n.d.). Densities are greater in areas that include the foothills and forested portions of the mountains. Here the density is approximately 5 sites per square mile, and it is suspected that the density is closer to 10 to 15 sites per square mile along canyons with flowing water (Reher n.d.). Occurrences of even greater site densities—up to 30 sites per square mile—have been reported for portions of the Red Wall/Middle Fork areas (Jameson 1977).

No historic or prehistoric sites in the resource area are being interpreted for the public. Two sites on public land are on the National Register of Historic Places: Cantonment Reno and Dull Knife Battlefield.

The resource area contains 65 known historic sites that warrant special preservation efforts, 37 on split estate lands and 28 on federal surface. Before any surface-disturbing federal undertakings that might damage them could be authorized, the BLM will consult with the State Historic Preservation Officer (SHPO) and initiate proceedings under section 106 of the National Historic Preservation Act of 1966.

The section 106 process will identify appropriate mitigative procedures such as camouflage painting and data recovery. It should be noted that some



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sites include both split estate and "federal only" lands. The policy of the BLM in Wyoming is to give higher priority to protection of sites on federal surface/federal minerals than to those on split estate. In addition, sites on federal surface/federal minerals may be subject to more stringent protective measures than those on split estate lands, in accordance with the wishes of private surface owners.

The 37 sites listed below, which are on split estate (total 2,315 acres), are all considered potentially eligible for the National Register of Historic Places on the basis of inventories conducted by the BLM.

LX Bar Ranch, 80 acres (48CA274); Indian Butte, 80 acres; Dull Knife Battlefield, 40 acres (48JO092); Ruby Site, 40 acres (48CA302); Carter-Kerr-McGee, 5 acres (48CA12); Mooney Site, 2.5 acres (48CA104); Tree II, 10 acres; Schultz-Taylor, 160 acres (48JO306); Outlaw Cave Archeological District, 27.5 acres (sites 48JO20, 48JO035, 48JO037, 48JO038, 48JO124, 48JO304, 48JO373, 48JO376, 48JO424, 48JO828, and 48JO832); Kaufman Cave, 2.5 acres (48SH301); Mavrakis-Bentzen-Roberts site, 40 acres (48SH31); Powder River site, 160 acres (48SH312); sites 48CA89, 48CA85, 48CA289, 48CA413, 48CA425, 48CA551, 48CA564, 48CA581, and 48JO105, 37.5 acres total; Fort Reno, 10 acres; Piney Creek, 40 acres; the Smith Draw segment and Lake DeMet segment of the Bozeman Trail, 600 acres; Kinney Crossing, 640 acres, and the Sawyer Wagon Train sites (340 acres).

The following 28 sites on federal surface total 2,914 acres.

Crazy Woman Battlefield, 300 acres; Dull Knife Battlefield, 1,340 acres; Cantonment Reno, 572 acres; Outlaw Cave Archeological District, 32.5 acres (sites 48JO18, 48JO38, 48JO51, 48JO301, 48JO302, 48JO303, 48JO305, 48JO374, 48JO375, 48JO377, 48JO380, 48JO468, and 48JO517); 48CA977, 2.5 acres; 48JO119, 80 acres; 48JO182, 40 acres; 48JO390, 10 acres; 48JO452, 10 acres; 48JO549, 2.5 acres; 48SH178 (All Day site), 180 acres; 48SH206, 2.5 acres; 48SH208, 10 acres; Gray-Taylor (48JO303), 10 acres; Sweet-Taylor (48JO301), 2.5 acres; and Bozeman Trail (two segments), 320 acres.

There are 2,477 known prehistoric sites in the resource area—390 in Sheridan County, 547 in Johnson County and 1,540 in Campbell County. These sites encompass approximately 2,500 acres.

Because most prehistoric sites in the resource area are limited activity areas, it was assumed that each site might average 1 acre.

There are 820 known historic sites in the resource area—169 in Sheridan County, 223 in Johnson County, and 428 in Campbell County. Overall, historic sites represent 22% of the total known cultural sites in the resource area. The other 78% are prehistoric. Historic sites in this resource area encompass approximately 8,000 acres.

The resource area contains several large battlefield areas and fort sites as well as extensive homestead complexes. Historic sites were therefore estimated to average 10 acres each, and the figure was then rounded.

Since the overwhelming majority of Paleo-Indian sites are deeply buried and many sites can be obscured by vegetational ground cover, they are less likely to be discovered during a Class III survey. Because of this, BLM Wyoming State Office policy requires ground-disturbing activities to cease operation if cultural materials are encountered during construction. The operation is delayed only until a professional archeologist can evaluate the remains and recover any significant information.

WSA Cultural Sites

Historic sites in the Gardner Mountain WSA are portions of Fraker Mountain and Fraker Pass and portions of the Dull Knife Battlefield, which was the scene of a battle in 1876 between the U.S. Cavalry and the Northern Cheyenne Indians in 1876. No systematic cultural resources survey has been conducted in the WSA; however, a petroglyph site and a burial cave are recorded in the unit.

In the North Fork of the Powder River WSA, 21 archeological sites or sites have been recorded—5 rock shelters and 17 lithic scatters.

No cultural resource surveys or sites have been recorded in the Fortification Creek WSA.

Previous Investigations in the Area

Only two large scale archeological studies had been undertaken before 1973 in the Powder River Basin region, of which the Buffalo Resource Area is part. The Smithsonian River Basin survey was conducted in 1949 as a response to the proposed Moorehead Reservoir (Wheeler n.d.). Several significant sites were identified during this investigation. George Frison conducted a large scale excavation of the Ruby site near Pumpkin Buttes in 1971.

Since 1973, several archeological inventories have been done for projects associated with oil and gas, coal, uranium, transmission lines, and roads. In addition to these Class III inventories, several small-scale and large-scale Class I reports have been completed. Of particular note is the Casper District's "Class I Historic Resource Study"

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completed by Western Interpretive Services in 1978. This report gives a good general overview of events in the district that serve as sources of historically significant sites.

Three major Class II inventories also have been conducted. Charles Reher's "Western Powder River Basin Study" (n.d.), Metcalf-Zier's Eastern Powder River Basin study (1981), and Ziemens and Walker's "Archeology of the Eastern Powder River Basin, Wyoming" (1977) all have contributed to our understanding of prehistoric lifeways in the region.

Prehistoric Chronology

The prehistoric chronology developed for this region is based on excavations and inventories within the larger geographic area of the Northwestern Plains. To date not enough large-scale excavations have been done in the Powder River Basin to develop a chronology without relying on work conducted outside the basin.

The first temporal framework for the Northwest Plains was developed by Mulloy in 1958. This framework was revised and refined by Frison in 1978. The chronology devised by Frison lists five broad periods of regional occupation: Paleo-Indian, 11,200-7,500 before present (B.P.); Early Plains Archaic, 7,500-5,000 B.P.; Middle Plains Archaic, 5,000-3,000 B.P.; Late Plains Archaic, 3,000-1,700 B.P.; and Late Prehistoric, 1,700-300 B.P. This chronology has been continually refined. The currently accepted time periods are delineated in the following sections.

Pre-Paleo-Indian Period

Although there is no demonstrable evidence at this time to verify a Pre-Paleo-Indian period in the Powder River Basin, evidence from other geographic locations appears to document such early occupation on the continent. A few scattered sites have been reported in North America, Central America, and South America. However, probably the most reliable discovery is butchered bone found in upper Late Pleistocene deposits in the Yukon Territory of Canada (Morlan 1978). These artifacts date to 23,000-29,000 years B.P. Even though we cannot definitely state that the Powder River Basin was occupied earlier than 11,500 years ago, we can identify areas that might be the most likely to reveal Pre-Paleo-Indian sites if such sites do exist.

While working on a cave site along Little Canyon Creek in 1978-79, Frison and Shaw discovered an unspecified tool assemblage in association with extinct Pleistocene fauna. Unfortunately, no radiocarbon dates were available for this site, but such dates might come from similar rock shelter/cave sites in the Big Horn Mountains. If funding ever becomes available, these shelter locations should receive attention. Discovery of a Pre-Paleo-Indian period in this region would be of monumental importance.

Paleo-Indian Period

The Paleo-Indian period dates from approximately 11,500-8,000 years B.P. This era of human occupation represents the earliest documented presence in the Northwest Plains. Sites in the Powder River Basin that exhibit Paleo-Indian elements include the Carter-Kerr McGee site in Campbell County (Frison 1978), the Sisters Hill site (Frison and Ziemans 1976), Schiffer Cave site (Frison 1973), and the Grey-Taylor site (Haynes, Damon, and Grey 1966), all in Johnson County. In addition, the "Tree 11" site southeast of Gillette, which has not been excavated yet, may contain a late Paleo-Indian component.

Early Plains Archaic Period

The Early Plains Archaic period dates from 8,000-4,500 years B.P. Early Archaic sites, which are rare in Wyoming, seem to be located in foothill or mountainous settings in the Big Horn range.

Several localities exhibiting Early Archaic components have been found in the Powder River Basin. However, few have been identified in the resource area; the Kaufman Cave site in Sheridan County (Grey 1962) is one of the few documented sites dating to this period in the counties at issue.

Middle Plains Archaic Period

Known sites of the Middle Plains Archaic Period in the Powder River Basin are the Mavrakis-Bentzen-Roberts (Bentzen 1962) and the Powder River sites in Sheridan County, as well as the Grey-Taylor site in Johnson County. These localities occur in mountainous areas as well as in basin flatlands. In fact, Middle Archaic sites are being discovered at an increasing rate in the Powder River Basin because of energy exploration.

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Late Plains Archaic Period

The Late Plains Archaic period dates from approximately 3,000-1,500 B.P. Sites dating to this time period, which are fairly common in the Powder River Basin, occur in a variety of ecological settings from basin areas to mountainous regions. The Big Horn Mountains, Red Wall, and Rochelle Hills apparently experienced widespread habitation during the Late Plains Archaic, and many stratified sites in these areas exhibit a Late Plains Archaic component.

Late Archaic material remains are common in the Powder River Basin. Included are Big Horn Mountains shelter sites like the Grey-Taylor, Schultz-Taylor, and Sween-Taylor rock shelters in Johnson County (Reher n.d.).

Sites in the basin area include the Ruby site near Pumpkin Buttes (Frison 1971) and the Mooney site near Gillette in Campbell County (Frison 1978). Several professionals believe that the Ruby site has not only national significance, but international importance (Reher n.d.).

Late Prehistoric Period

The Late Prehistoric period dates from approximately 1,500-300 B.P. Evidence of material culture is widespread across the Powder River Basin in flatlands, foothills, and mountain areas.

Sites known in the resource area are the Big Goose Creek site in Sheridan County and the Piney Creek site in Johnson County (Frison 1967).

Evidence of human occupation in the Buffalo Resource Area dates back some 12,000 years (Frison 1978). Physical remains of this occupation are scattered across the resource area in the form of prehistoric campsites, bison kill sites, stone circles, fire hearths, lithic quarries, stone cairn lines, and stratified sites caused by continued reuse of certain locations, particularly rock shelters.

Ethnohistoric Period

The "protohistoric" or "ethnohistoric" period refers to the time after Native American populations were exposed to European culture. At least three sites from that period are known in the Powder River Basin. Two trade bead sites were located during Metcalf-Zier's Eastern Powder River Basin survey, and one metal arrow point associated with a surface lithic scatter was discovered during the Cordero Coal mine survey (Farmer n.d.).

Historical Chronology

The first known historic travelers to reach this region in 1805 were members of Francois Antoine Larocque's Northwest Company. The Astorians from the American Fur Company crossed the divide between the Powder River and the Little Missouri River in 1811 and 1812. Emigrant traffic began in 1863 to proceed up the Powder River trail pioneered by John Bozeman and John Jacobs.

Notable events occurred over the Bozeman Trail at Crazy Woman Creek, Dull Knife Battlefield, Sawyer Wagon Train Fight site, and Fort Phil Kearny.

The Fetterman Massacre in 1866 was a desperate attempt on the part of the Powder River tribes to fight off the growing encroachment of whites in their treat-assured lands. All efforts failed. By the end of the 1870s the Plains Indian peoples were confined to reservations.

Troops from the Department of Dakota escorted a government scientific expedition in 1874 that had been directed to explore the Black Hills. The expedition was principally oriented toward geology. When gold was reported in the Black Hills, the gold rush in northeastern Wyoming began. Lt. Col. George Armstrong Custer, commander of the expedition, telegraphed the gold message across the country and miners began flocking to the area. Though the Black Hills were "unceded" Indian land guaranteed by the 1868 Fort Laramie treaties, the military could do little to stop gold seekers from invading the area in violation of treaty stipulations.

The Rock Creek Stage company began operations along the Bozeman Trail in 1877 to serve the increasing population. Several stage stations and a military telegraph were constructed along the route.

Homesteaders began seriously settling the region after 1880, forming small farms and ranches. Later, large cattle companies started competing with the small operations, and conflicts over rustling and who had the right to the use of open public land resulted in the Johnson County War of 1892. The LX Bar Ranch in Campbell County is a good example of a classic homestead.

The railroad reached Gillette in 1891, and homesteading efforts were stepped up accordingly. Sheep were introduced and energy production pursuits began. Coal mines and oil and gas activities were initiated as early as 1882. Large-scale oil development began in the 1950s and large-scale coal development in the 1970s.

Affected Environment

Physical evidence of early historic activities is present throughout the region in the form of historic trails (both Indian and European), mining camps, stage stations, homesteads, oil and gas sites, battlefields, and forts.

Cultural Resource Management

Goal and Mandates

The goal of cultural resource management is to identify and protect the cultural and historical values in the resource area from accidental or intentional destruction, to give special protection to high-value cultural resource sites or areas, and to manage cultural resources for public benefit. In addition, the computerization of cultural resources data has a high priority.

The BLM is required by FLPMA to maintain a current inventory of resource values on public

lands (Public Law 94-579, 90 Stat. 2747, Oct. 21, 1976). In addition, agency heads are directed by the National Historic Preservation Act of 1966 to "assume responsibility for the preservation of historic properties which are owned or controlled by such agency" (Sec. 110, Public Law 96-515, as amended in 1980). In order to comply with these legislative mandates, the Buffalo Resource Area, through the Casper District office, has established a program to locate, inventory, and nominate all properties under the agency's control that appear to qualify for listing in the National Register of Historic Places.

Program

The cultural resource program workload includes the following operations:

Monitoring and reviewing cultural work performed by contract archeologists and formulating management recommendations based



Affected Environment

on this contracted work, determining the appropriate level of inventory to be required for proposed surface-disturbing projects on public land.

Conducting surveys for BLM-initiated actions and, as personnel and time permit, for privately initiated projects on public land.

Daily operations and cultural resource management functions will be performed in accordance with laws, regulations, and policies in the following priority order:

Program guidance and support, including program coordination, technical direction, budgeting, and responding to public inquiries will have highest priority.

Priority for emergency/interim protection of cultural sites will be based on the degree or threat of site deterioration, accessibility to the public, significance of the site, and cost of proposed work.

When general inventory funding is available, highest priority for cultural inventories will be given to areas of public land where development is anticipated.

Activities related to public awareness, cultural resource management plans, and preparation of National Register nominations will have secondary priority. Lowest priority will be given to conducting inventories in areas involving private surface over federal subsurface.

Consideration During BLM Actions

Management of significant prehistoric and historic cultural values on lands administered by the BLM will include proper consideration of the effects of BLM undertakings upon significant cultural resources. Significant cultural resources will be identified through inventory and evaluated for significance in terms of eligibility for the National Register of Historic Places. When National Register quality cultural resources cannot be avoided or physically preserved by project redesign, BLM personnel will consult with the Advisory Council on Historic Preservation to ensure that scientific information of such sites is preserved for future study and analysis.

The first step in providing consideration of cultural resources that might be affected by a BLM undertaking is to conduct an inventory. The BLM has established three types of inventories. The class of inventory required depends upon the

nature of the activity and the possible degree of effect on cultural resources. It is the responsibility of each district manager, per *BLM Manual Instructions* (8143.1.11), to ensure that adequate inventory has been completed.

Management of Significant Sites

Regardless of the level of inventory, if any significant sites are identified that will be adversely affected by the proposed action, the BLM will consult with the SHPO and initiate proceedings under section 106 of the National Historic Preservation Act of 1966. That section requires the federal agency to consult with the Advisory Council on Historic Preservation before authorizing any action that might damage a significant prehistoric or historic site.

Significant sites identified in the Buffalo Resource Area are managed or protected according to one or more of the actions or measures described in this section. The actions taken will depend on the site value or significance, the location, the federal action or undertaking proposed, and a field inspection of the site. The following actions or protective measures could be implemented:

Inventorying areas containing cultural resources potentially significant for scientific and/or interpretive purposes. Inventory intensity would be based on potential impacts.

Data recovery of cultural resources where avoidance is impractical or impossible.

Determination of the eligibility of cultural resources for nomination to the National Register of Historic Places on the basis of National Register guidelines.

Protecting cultural sites listed in, or eligible for inclusion in, the National Register of Historic Places. Management may consist of a range of administrative and physical protection measures such as further research and data recovery.

Protection from Deterioration

Another important element of the BLM's cultural resources program in the resource area involves protection of cultural sites that are known to be deteriorating or threatened by natural or human forces. Once such a site is identified, the District Office requests special "protection and stabilization" funding so that significant data will not be lost.

Affected Environment

Because most of the cultural program workload is created indirectly through public demand, it is difficult to project the future program workload.

In addition, the BLM Casper District plans an ongoing data compilation project that would give the Buffalo Resource Area the ability to computerize its files and compose predictive models for determining high, medium, and low probability site density areas.

The normal fire season for the Buffalo Resource Area starts in early June and extends through September. During the normal fire season the most intense fires occur in forested or heavy-fuel areas or in steep-walled narrow canyons.

FIRE MANAGEMENT

Goals

The goal of the fire management program is to reduce losses by responding to emergency fire situations in a cost-effective manner, to complement resource management objectives, and to sustain the productivity of the biological systems through fire management.

Management

There are three major emphasis areas in fire management: protection of BLM-managed lands and resources from losses due to wildfire, restoration or rehabilitation of burned areas, and the use of fire as a management tool.

Fire management is to be conducted in accordance with *BLM Manual* sections 9210-9213, 9215, 9218, and 7441. The highest priority will be given to suppressing wildfire on or threatening BLM-administered lands. When multiple fires occur, suppression priority will be given to fires threatening areas of highest value.



Affected Environment

Fire occurrence within the resource area has ranged from two or three fires in a low year to 12 in a high fire occurrence year. Most fires are controlled at less than 5 acres, but occasionally fires consume more than 125 acres before control. Lightning has been the major cause of wildfire. Human-caused fires average less than one per year.

Limited suppression of wildfire is a management option that is not now available because there are no current fire management plans for limited suppression. In this method of fire control, an agency would deviate from normal suppression tactics to provide the suppression at costs that are more in line with the values of the resource being protected, while considering the safety of fire personnel. Areas in which limited suppression may be considered are areas having a value-at-risk Class I or II or areas having low value resources. Class I and II areas are shown on map 4. The Glossary contains definitions of the value-at-risk classifications.

Another fire-related option not currently available is prescribed burning conducted to benefit resource programs, primarily range, wildlife, and forestry.

GEOLOGY AND PALEONTOLOGICAL RESOURCES

Area Geology

The Buffalo Resource Area encompasses parts of two physiographic provinces, the Middle Rocky Mountains, of which the Big Horn Mountains are a part; and the Wyoming Basin; of which the Powder River Basin is a part. Both the Big Horn Mountains and the Powder River Basin are Laramide age structures. Rock exposures are mostly Tertiary or Holocene within the basin; Mesozoic and Paleozoic sediments are exposed along or near the mountain flank. Precambrian rocks are exposed only near mountain crests or in the bottoms of deep canyons along the mountain slopes.

Geologic Hazards

The entire Buffalo Resource Area is in a zone of minor damage from earthquakes. Fault lines along the flanks of the Big Horn Mountains suggest the

area's potential for earthquakes. There are smaller fault lines in isolated areas of southeastern Johnson County, southeastern Sheridan County, and northwestern Campbell County. Movement may have occurred along faults near the flanks of the Big Horn Mountains within the past 2 million years, possibly as recently as within the past 10,000 or 20,000 years.

Six seismic events have been recorded since 1890 whose epicenters were in the Buffalo Resource Area. They ranged from about 4 to 4.8 on the Richter scale. No serious damage resulted from any of these events, although many people felt them. The most recent major earthquake in the surrounding region was the 1959 earthquake near West Yellowstone, Montana, about 225 miles west of Johnson County. Tremors that were felt in Campbell County caused some minor structural damage.

Methane Gas

Methane gas occurs in geologic formations associated with coal beds. This has been evident especially in the Recluse area, where some blowouts have been caused during drilling when methane gas was expelled from wells less than 200 feet deep. Volumes are reported to be as much as 1 million cubic feet of methane gas per day from a hole 4 inches in diameter. The greatest hazard occurs during drilling or when water levels are low from excessive drawdown. Recognition of the potential problems and proper precautions greatly reduce the hazard (USDI, GS 1978).

Paleontological Resources

Protection of paleontological material extends only to fossils of significant scientific interest (Antiquities Act of 1906, P.L. 59-209, 34 Stat. 225, 16 USC 432, 433). Under present usage, vertebrate fossils are usually the only significant (and therefore regulated) fossils. Removal of significant fossils from public land is authorized by Antiquities Act permits. As localities and specimens are found by Antiquities Act permittees and BLM personnel, they are recorded and cataloged.

No significant vertebrate paleontological sites are known in the Buffalo Resource Area. Paleobotanical studies are being conducted in the Dry Creek Petrified Tree Environmental Education Area.

Affected Environment

LAND USES

Forestry

Forest Resources

The BLM administers approximately 10% (40,000 acres) of the commercial forestland (see Glossary) in the Buffalo Resource Area and supplies about 11% of the area's timber. The commercial forestlands administered by the BLM, which contain a total volume of about 120 MMBF, are concentrated primarily in the southern portion of the Big Horn Mountains (36,000 acres). Smaller scattered tracts are in northern Campbell County, northeastern Sheridan County, and along the steep front range of the Big Horn Mountains in Sheridan County.

The total volume in the commercial forestland in the entire resource area, including forestlands administered by the Forest Service, is estimated at 1.5 billion board feet.

The primary tree species found on the commercial forestlands are ponderosa pine (59%), Douglas-fir (25%), lodgepole pine (12%), and spruce-fir (4%). The commercial forestlands could support an annual sustained yield harvest of approximately 1.4 MMBF if intensive management practices and no harvest restrictions were applied. However, multiple use and operational constraints limit the current annual allowable harvest level to about 1 MMBF.

The typical annual timber harvest in the resource area consists of 1 MMBF of sawtimber, 50 MBF of posts and poles, and 200 cords of fuelwood. The demand for sawtimber has been steady and is

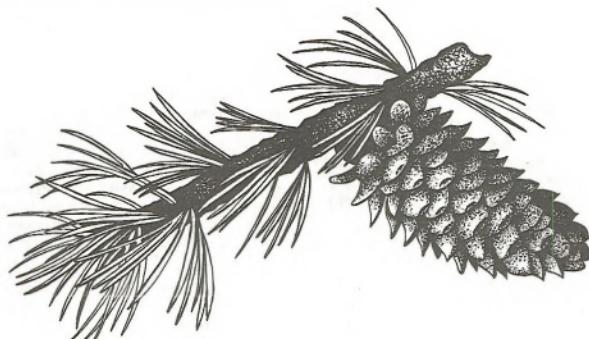
projected to remain at approximately 1 MMBF annually in the near future. The demand for fuelwood and for posts and poles has been increasing, and the increase is projected to continue.

In addition to the commercial forestlands, the BLM administers 30,000 acres of woodlands (see Glossary). These woodlands are scattered throughout the southern portion of the Big Horn Mountains, including the Middle Fork area; in the Powder River Breaks in Campbell, Johnson, and Sheridan counties; and in the Tisdale Mountain-Pine Ridge area near Kaycee. The primary tree species of the woodlands are ponderosa pine, limber pine, and Rocky Mountain juniper. The total volume of wood fiber and the annual sustained yield capability of the woodlands have not been computed; however, it is estimated that the woodlands could support an annual allowable harvest of 100 to 150 MBF. No wood products from the woodlands are being offered for sale to the public at this time.

Commercial forest and woodlands resources within the Gardner Mountain, North Fork of the Powder River, and Fortification Creek WSAs are shown in table 3-4.

Forest Management

The goals for the forest management program are to contribute toward meeting the area's demand for wood products, to convert overmature or unmanaged stands to manageable conditions, and to maintain current forest inventories and management plans.



Affected Environment

TABLE 3-4
FOREST RESOURCES WITHIN WILDERNESS STUDY AREAS

Wilderness Study Area	Commercial Forestland				Woodland			
	Acres	Volume (MMBF) ^a	Species	Estimated Annual Sustained Harvest	Acres	Volume (cu. ft.) ^b	Species	Estimated Annual Sustained Harvest
Gardner Mountain	753	4	Ponderosa pine Douglas-fir	55 MBFC	977	675,000	Ponderosa pine Liber pine	16,000 cu. ft.
North Fork of Powder River	2,901	18	Ponderosa pine Douglas-fir	261 MBFC	3,958	2,400,000	Ponderosa pine Liber pine	67,000 cu. ft.
Fortification Creek	None	0	--	0	1,000	100,000ft	Rocky Mtn. juniper	5,000 cu. ft.

a. MMBF = million board feet.

b. cubic feet.

c. MBF = thousand board feet.

The overall forest management policy for the Buffalo Resource Area is in line with the BLM policy; that is, forestlands identified as available for forest management through land use planning efforts will be managed in a manner that recognizes and accommodates other important intrinsic resource values such as wildlife, water, visual resources and soils. Timber on BLM lands will be cut and removed in conformance with the principles of multiple use sustained yield for the purpose of contributing to the economic stability of dependent timber industries and local communities.

The forest management program for the Buffalo Resource Area encompasses management activities such as timber sales, sale administration, forest inventory, forest development, insect and disease control, and access planning.

Implementation of management activities on the commercial forestland has been, and is projected to continue to be, complex because of the rugged terrain, lack of legal access, big game considerations, livestock grazing, and the general overaged and undeveloped condition of the forestlands.

The BLM in Buffalo has been offering between 500 MBF and 1.5 MMBF of timber annually in the last five years. Most of these offerings have been commercial sawtimber sales; the rest have been small sales of fuelwood and of posts and poles. The demand for sawtimber has been steady, and it is projected to remain at current levels in the

near future. However, the demand for fuelwood and for posts and poles has been increasing annually for at least the past five years.

Grazing

History

Livestock grazing leases on all of the public lands administered by the BLM in the Buffalo Resource Area are issued under the authority of section 15 of the Taylor Grazing Act of 1934. The section 15 lands are those outside the grazing districts formed under the act. The regulations and administrative policies regarding authorization of livestock grazing on the section 15 lands are basically the same as the procedures followed on the section 3 lands (those within grazing districts). However, the section 15 lands historically have received the lowest priority for application of BLM-initiated management.

Before 1949, most of the public land in the Buffalo Resource Area was "open range" and was considered an area of common use. In 1949 the BLM published a preliminary land planning and classification report covering the Missouri River Basin (MRB). The report identified a number of resource-related problems on public and private land within the basin. In response to this report, the BLM conducted an extensive range survey throughout the Missouri River Basin from 1949

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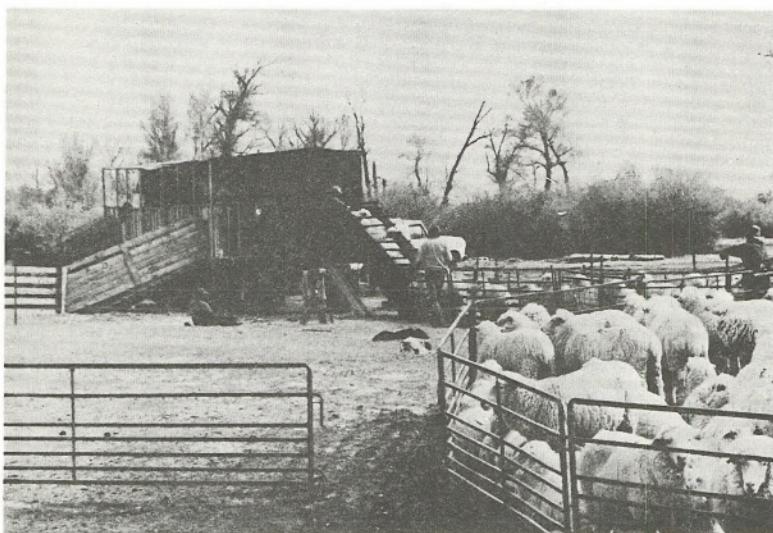
through 1954. Among other data, the survey provided an estimate of carrying capacity, or stocking rates, on lands in the basin.

Individual allotment or lease boundaries were established in 1956. Leases in this area were administered by the Casper District Office. For the next 19 years, the BLM lands were administered strictly for grazing. The district office issued ten-year leases and collected annual fees on the allotments but prescribed little management regarding kinds of livestock, livestock numbers, or period of use. The MRB-rated stocking rate was used for billing purposes only. Enforcement of the recommended stocking rates was limited.

Management of grazing on the BLM lease lands was initiated by the individual ranchers. In most cases, ranchers applied the same management intensity and level of use on the BLM land as on their deeded and state lease lands. Nearly all of the range improvements constructed on the BLM lands at that time were paid for and built by the individual lessees under section 15 range improvement permits issued by the BLM.

The resource area headquarters was detached from the Casper District Office and moved to Buffalo in 1974. The first AMP for the resource area (lease 7175) was completed and two more were being planned when a lawsuit was filed against the Secretary of the Interior by the Natural Resources Defense Council, Inc. The lawsuit resulted in a decision that the BLM must file detailed EISs on public lands used for livestock grazing to comply with section 102.2 of NEPA. The decision directed that the statements must develop alternative levels of livestock use and analyze their effects. In effect, the BLM was not permitted to implement any AMPs, or their equivalent, after the end of fiscal year 1975 until an EIS to cover those AMPs could be prepared.

The only AMP now in force in the resource area is the one completed before that decision. Range trend and condition studies are coordinated and maintained on that AMP. Other leases in the resource area are issued for either seasonal or year-long grazing.



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Current Grazing Needs

The Buffalo Resource Area contains an estimated total of 920 ranch operations. Approximately 43% of these operations hold BLM grazing leases. The leases range in size from less than 40 acres to more than 38,000 acres. Of the 408 leases issued in the Buffalo Resource Area, there are 169 (41%) containing more than 100 AUMs, and of these there are 54 (13%) that produce more than 500 AUMs of livestock forage.

It is estimated that the BLM-administered lands supply 100,000 AUMs, or about 5% of the total forage demand in the resource area (2 million AUMs). The dependence of individual ranch operations on the forage produced on their BLM lease varies from almost nothing to critical, depending primarily on the acreage leased. On the larger leases, the BLM lands are often important in satisfying seasonal forage needs. The demand for livestock forage is projected to remain at approximately the current levels over the next ten years.

Most of the resource area's forage is produced on private lands. Forage production estimates and recommended stocking rates on BLM-administered land are based on the range survey that was completed in conjunction with the 1949-1952 MRB studies. On the basis of this survey, forage production from BLM-administered land was set at 95,545 AUMs. The stocking rate ranges from 1 acre per AUM on mountain meadows to 21 acres per AUM on breaks and forestland. The average stocking rate is 8 acres per AUM. Table 3-5 indicates the kinds of livestock grazed on the various allotments.

TABLE 3-5
LIVESTOCK USE IN THE BUFFALO RESOURCE AREA

Kind of Stock	Number of Allotments	Percentage ^a	Authorized AUMs	Percentage
Cattle	324	80	81,686	86
Sheep	34	8	11,145	12
Horses	3	1	195	0
Yearling cattle	5	1	1,465	2
Buffalo	1	0	53	0
Cattle and sheep	30	7		
Cattle and horses	6	1		
Cattle and yearlings	2	0		
Other combinations	3	0		
Total	408		94,545	

^aPercentage numbers do not add to 100% because of rounding.

Grazing Management

The goal of the grazing management program is to provide for livestock grazing on public land on a sustained yield basis according to established principles of grazing management and in compliance with laws, regulations, and applicable court orders.

Grazing Leases

The Buffalo Resource Area administers livestock grazing on approximately 735,000 acres of public land in Sheridan, Johnson, and Campbell counties. Approximately 230 annual grazing leases (allotments) and 175 multi-year leases are issued to a total of 390 individual operators (see table 3-6). The lands not under grazing lease are either withdrawn for stock driveway use (24,000 acres), classified as unsuitable for livestock use because of steep slope or low forage production (4,000 acres), or administered by another resource area office.

The multi-year leases have been issued on allotments where current information concerning livestock numbers, kind of livestock, and period of use by pasture has been obtained. Annual leases are issued on allotments where such detailed information is not available. Most leases issued on a seasonal or year-round basis are issued for the full rated stocking rate of the public land as established by the 1954 MRB survey. However, on three allotments (less than 50 AUMs) the stocking rates have been adjusted downward because of energy-related surface impacts, which have reduced the stocking rates. Grazing use on seven allotments has been adjusted upward by a total of 1,780 AUMs from the MRB surveyed stocking rate. These adjustments were based on allotment resurveys and actual use information.

The Gardner Mountain and Fortification Creek WSAs each contain portions of three livestock grazing allotments. The North Fork of the Powder River WSA contains portions of two livestock grazing leases and all of a third lease. The MRB range survey set the livestock stocking rates of public land now in Gardner Mountain WSA at 389 AUMs, in the North Fork WSA at 1,195 AUMs, and in Fortification Creek WSA at 1,350 AUMs.

The one AMP in the resource area covers 8,149 acres of BLM-administered land. It was developed cooperatively by the BLM, the Soil Conservation

Affected Environment

TABLE 3-6
GRAZING LEASES IN THE BUFFALO RESOURCE AREA

	Amount	Percentage	AUMs	Percentage	Acreage	Percentage
Annual lease	233	57	73,811	78	561,457	76
Multi-year lease	175	43	20,734	22	173,262	24
Total	408		94,545		734,719	

Service, the Wyoming Game and Fish Department, and the range user in 1975. The grazing system authorized by the AMP implements a multi-pasture deferred rotation grazing system. Range trend monitoring studies on this allotment indicate that no change in present management is necessary.

In addition to the administration of grazing use on allotments, the resource area administers livestock trailing on some 50 miles of livestock driveway covering 24,000 acres. Utilization and photo point studies are maintained on these livestock driveways. Each year the resource area issues approximately 50 trailing permits authorizing use of the stock driveway by approximately 27,000 head of sheep and 4,200 head of cattle. Other administrative work in the area includes the transfer of 20 to 25 grazing leases, along with the investigation and resolution of one livestock trespass annually.

Administration of Allotments Outside Resource Area Boundary

The Buffalo Resource Area maintains cooperative agreements with three adjoining BLM resource areas regarding grazing administration on allotments whose boundaries extend beyond the resource area boundary. Under the terms of these agreements, one resource area is responsible for handling the grazing administration of an entire allotment regardless of whether the allotment extends beyond the resource area boundary. This provides for continuity of management on the allotments and benefits the operators by limiting the number of BLM offices with which they have to deal.



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Which office will handle the administration of an allotment lying in two resource areas is normally determined by evaluation of two factors. The primary consideration is the percentage of the operation or allotment that lies in the resource area. The resource area in which most of the allotment lies usually will handle the grazing administration for the entire allotment. A secondary consideration is the location of the allotment

operator's base ranch. The resource area in which the base or home ranch is located will normally handle administration of all the operator's allotments. Table 3-7 summarizes the public grazing lands administered by the Buffalo Resource Area that are outside its boundary and grazing lands within the Buffalo Resource Area that are administered by other resource areas.

TABLE 3-7
GRAZING ON PUBLIC LANDS OUTSIDE
BOUNDARIES OF ADMINISTERING RESOURCE AREA

Grazing Lands of Other Resource Areas Administered by Buffalo Resource Area

County	Number of Operators (leases)	BLM Acreage	AUMs
Crook	1	1,149	191
Natrona	4	7,309	929
Washakie	10	3,034	756

Grazing Lands of Buffalo Resource Area Administered by Other Resource Areas

BLM Office	County	Number of Operator (leases)	BLM Acreage	AUMs
Washakie Resource Area	Johnson	1	400	90
Newcastle Resource Area	Campbell	3	4,622	721
Platte Resource Area	Johnson	8	40,570	5,273

Range Condition

Range condition is the present state of vegetation of a plant community in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community for the site. This provides an ecological rating of the plant community. Air-dry weight is the unit of measure used in comparing the composition and production of the present plant community with that of the climax community (USDA, SCS 1976).

A comprehensive range inventory or range survey has not been completed in the resource area since the MRB survey of 1949 to 1954.

However, a large portion of the public land in the resource area was resurveyed in 1968 (see table 3-8). A forage condition survey was conducted in part of the resource area in 1976 and 1977 for the Buffalo unit resource analysis.

TABLE 3-8
MISSOURI RIVER BASIN RANGE CONDITION SUMMARY OF 1968
("resurvey")

Condition	Percentage of Plant Cover	Percentage	Acreage
Excellent	75%-100% of original plant cover	28	138,922
Good	50%-75% of original plant cover	58	287,767
Fair	25%-50% of original plant cover	11	54,576
Poor	0%-25% of original plant cover	3	14,885

Affected Environment

The original MRB range survey showed that approximately 70% of the public lands were in unsatisfactory (less than good) range condition. According to the range condition report compiled from the 1968 MRB resurvey, 14% of the public lands surveyed were in unsatisfactory condition. On the other 86% of the land surveyed, the plant community was found not to have changed substantially from the climax plant community.

The MRB surveys determined ecological range condition for each range site on the basis of a comparison between the existing site vegetation versus what the site was originally (potentially) capable of producing. The potential plant community was therefore determined by evaluating relict rangesites, grazed areas with known records of past use, available literature on the soils and ecology of the area, and historical narratives and photographs (USDI, BLM 1963).

The BLM conducted a modified range condition inventory in 1976 and 1977 on about 75% of the public land in the resource area. This inventory did not provide an evaluation of ecological range condition; rather, it might more appropriately be considered a forage condition inventory. The condition of the rangelands was rated as good, fair, or poor according to the percentage of certain forage species within a vegetation type. The forage species were rated as desirable, less desirable, or least desirable without regard to the range potential or the soil where the plants occurred. The inventory rated forage condition in the area 35% good, 50% fair, and 15% poor.

Range site analysis and range condition mapping were conducted in 1983 on three allotments involving approximately 45,000 acres of rangeland, including 35,000 acres of public land. Current scheduling calls for the completion of approximately 20,000 acres per year. Ranch unit inventories have been completed on 202 ranch operations (roughly 50% of the unit) in the resource area. These inventories involve determination of kind and numbers of livestock, their seasonal disposition, and the percentage of federal range on the individual ranch unit.

Trend is the direction of change in range condition. Trend is usually expressed as improving, stable, or declining. In the evaluation of trend, the following indicators of range condition trend are considered: presence, vigor, and reproduction of desirable and less desirable forage species; utilization levels; litter accumulation; and evidence of accelerated erosion.

Several factors influence trend in range condition. Declining trend may be caused or accelerated by management practices such as overstocking, improper season of use, and poor distribution of use. Other causes are factors such as drought, noxious weeds, or pest invasions. Improving trend in range condition generally results when grazing management practices provide for the physiological needs of desirable forage plants.

Personal communications with longtime residents of the area indicate that the overall trend in the resource area has been toward improved range condition. This observation is substantiated by the 1968 MRB resurvey, which showed 14% of the area to be in less than good condition. The 1944-1954 survey had rated approximately 70% of the area in less than good condition. Comparison of data collected during the 1983 Inventory of three allotments indicates a similar trend toward improved range condition (see table 3-9).

Allotment Categories

The criteria for categorization of federal grazing allotments in the resource area were developed and approved in 1982. Through application of these criteria, all allotments have been categorized as either "M" (maintain), "I" (improve), or "C" (custodial) (see appendix 3). Table 3-10 lists the acreage of grazing allotments in each management category. Appendix 6 lists the number and kind of livestock, period of use, federal AUMs, and management priority.

Range Improvement Projects

Approximately 700 range improvement projects are authorized on public land in the resource area. Most are fences (900 miles), and reservoirs (187). Other authorized range improvements in the resource area are 43 water wells, 23 miles of pipeline, 18 springs, 9 corrals, and 1,800 acres of sagebrush treatment.

Approximately 12 range improvement projects are planned and approved each year. Range improvements constructed from 1979 to 1983 were 26 miles of fence, 25 miles of pipeline, 11 reservoirs and 1 check dam, 12 wells for livestock water, 5 spring developments, 1 storage tank for livestock water, and 3 corrals. Miscellaneous additional projects are a road closure, a stock driveway crossing, an erosion control project, a stream improvement, and a fertilization test. About

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TABLE 3-9
COMPARISON OF DATA FROM 1954 MRB AND 1983
BLM RANGE SURVEYS AND SUMMARY OF 1983 MAPPING

	1954	1983
Excellent	0	1%
Good	20%	73%
Fair	58%	21%
Poor	22%	1%
Unclassified	0	4%

Summary of 1983 Range Site and Condition Mapping

Condition	Percentage of Original Plant Cover	Acreage ¹			Total Acreage
		Lease 7103 (portion)	Lease 7203 (portion)	Lease 7271 (all)	
Excellent	75-100	787	0	0	787 (1%)
Good	50-75	3,940	1,496	27,847	33,283 (75%)
Fair	25-50	1,181	2,017	6,158	9,356 (21%)
Poor	0-25	39	0	371	410 (1%)
Unclassified	—	197	900	530	1,627 (4%)
Total		6,144	4,413	34,906	45,463

¹Acreage includes state and private land as well as BLM-administered public land.

TABLE 3-10
BUFFALO RESOURCE AREA ALLOTMENTS BY CATEGORY

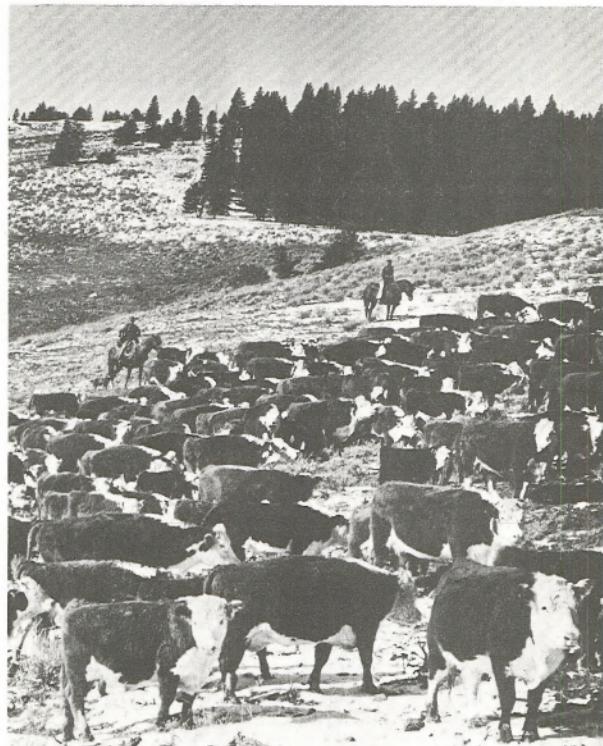
Category	Number of Allotments	Percentage	Acreage	Percentage	AUMs	Percentage
Maintain (M)	98	24	320,981	44	43,573	46
Improve (I)	29	7	273,292	37	28,968	31
Custodial (C)	281	69	140,446	19	22,004	23
Total	408		734,719		94,545	

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half these projects are funded entirely by the range users. Most of the rest are cooperative projects funded jointly by the range user and the BLM. A few projects are funded entirely by the BLM.

Area policy concerning construction of range improvement projects following the NRDC suit restricted construction of most types of structural improvements and all kinds of nonstructural range improvement projects such as spraying, seeding, or prescribed burning. Structural range improve-

ments are approved only if it is determined that the proposed project would not alter the existing levels of livestock use or livestock grazing patterns on public land. Under this policy, range improvement work consists of reconstruction or maintenance of existing projects. New allotment boundary fences are allowed; however, no new pasture or cross fences can be constructed. New water developments are approved only if they supplement existing water facilities; for example, a reservoir could be constructed to supplement water from an existing well.



Courtesy of Wyoming Travel Commission

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Weed and Pest Control

The resource area maintains annual contracts with two county weed and pest control districts for treatment of noxious weeds. Almost all BLM contract money goes for control of leafy spurge, of which about 300 acres have been treated annually. Most of the leafy spurge on BLM-administered land is in small scattered patches within the 7,700-acre Clear Creek watershed. It is estimated that the infested acreage has stabilized, with the control work roughly balancing the rapid growth of the weed.

Grasshopper control on BLM-administered land in the Buffalo Resource Area has been conducted under a cooperative agreement with the U.S. Department of Agriculture, Animal and Plant Health Inspection Service (APHIS). There has been no spraying on BLM land for control of grasshoppers during the past five years. Acreage treated in the resource area from 1975 to 1977 is shown on table 3-11.

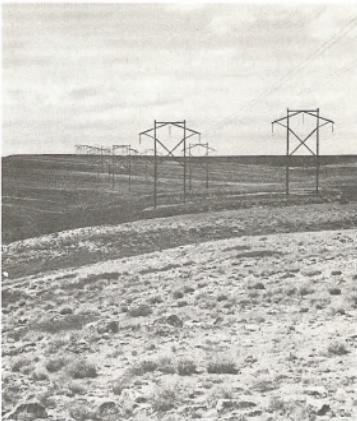


TABLE 3-11

GRASSHOPPER CONTROL IN THE BUFFALO RESOURCE AREA

Area	Year	Acreage Private	Acreage Treated BLM	Total
South Johnson County	1975	72,525	17,395	90,460
Northwest Campbell, northeast Johnson, southeast Sheridan counties	1976	65,346	2,854	68,000
Northeast Johnson, southeast Sheridan counties	1977	56,245	4,510	60,755

Lands and Realty

Surface Ownership

The three-county planning area of the Buffalo Resource Area contains a total of 7,338,880 acres. The surface ownership/management breakdown per county and the total mineral ownership per county is shown on table 3-12. The percentages of federally owned mineral resources in each county that underlie privately owned surface are also indicated on that table.

Public land surface under the administration of the BLM is reasonably well consolidated in the Powder River Breaks, the Rochelle Hills area southeast of Gillette, the south end of the Big Horns in southwest Johnson County, and some

areas in northeast Campbell County. The rest of the BLM-administered public land in the Buffalo Resource Area is in relatively small, isolated tracts intermingled with private land.

Privately owned minerals are concentrated in the northern half of the eastern edge of Campbell County; northwest and south of Buffalo and along the major water drainages in the west half and southwest quarter in Johnson County; and along the major drainages and the west half of Sheridan County (excluding Forest Service lands).

Federally owned minerals of all kinds are concentrated in the west side of Campbell County but intermingled with privately owned minerals on the east side; they are concentrated in the east half of Johnson County but intermingled with private minerals in the southwest quarter of the county; and they are generally concentrated in the east quarter of Sheridan County.

Federal coal is intermingled with other private and federally owned minerals throughout Campbell County, but it is generally concentrated in the central portion of the county from Gillette south to the county line. Concentrations of federal coal in Johnson County lie north of Buffalo and in a large block approximately 25 miles southeast of Buffalo. Federal coal in Sheridan County is concentrated in the quarter of the county that lies just east of Sheridan. Map 2 shows mineral ownership.

TABLE 3-12
SURFACE OWNERSHIP AND FEDERAL MINERAL RESERVES
IN THE BUFFALO RESOURCE AREA

County	BLM		Forest Service		Other Federal Agencies		State		Private		Total Acreage
	Acreage	%	Acreage	%	Acreage	%	Acreage	%	Acreage	%	
Sheridan County	50,730	3%	393,399	24%	5,777	1%	139,290	8%	1,031,284	64%	1,620,480
Johnson County	512,051	19%	326,877	12%	1,174	1%	242,730	9%	1,591,728	60%	2,674,560
Campbell County	236,067	8%	158,002	5%	3,031	1%	219,460	7%	2,427,280	79%	3,043,840
Buffalo Resource Area Total	798,848	11%	878,278	12%	9,982	1%	601,480	8%	5,030,292	68%	7,338,880

Federal Mineral Reserves under Nonfederal Lands

	Acreage	Percentage of County
Sheridan County	641,520	40%
Johnson County	1,167,557	43%
Campbell County	2,125,459	69%
Buffalo Resource Area Total	3,934,536 acres	

SOURCE: Wyoming Public Land Statistics

Affected Environment

Lands and Realty Management

The goals of the lands and realty program are to respond in a timely manner to all requests for realty action and authorization on public land while considering environmental, social, economic, and interagency concerns; to increase the overall efficiency and effectiveness of public land management through land sales and exchanges; and to provide access to public land in support of other resource programs.

The major program workload involves authorizing a variety of land uses including rights-of-way, land sales and exchanges, R&PP leases and patents, and permits or leases. Other activities are reviewing withdrawals, handling unauthorized use (trespass), and acquisition of access.

Rights-of-way

Rights-of-way constitute a major demand workload in the resource area, having grown from approximately 20 energy and 8 nonenergy rights-of-way annually before FLPMA to approximately 90 energy and 12 nonenergy rights-of-way in fiscal year 1983. Energy-related rights-of-way for access roads and pipelines generate a large portion of the demand workload, affecting approximately 270 acres per year. Rights-of-way not related to energy include those for telephone and electric lines, access roads, federal, state, and county highways, railroad routes, water wells and pipelines, and communication sites. Such rights-of-way would affect approximately 15 acres per year.

For the term of this plan, it is projected that the number of right-of-way cases will remain at about 90 cases per year. The number of land sales and exchanges is expected to increase once this plan is completed. Recreation and public purpose applications are expected to decrease slightly in the future.

Ownership Adjustments

Land surface adjustments include land sales, exchanges, and R&PP leases and patents. All land sales are initiated by the BLM. Only three sales have been initiated since 1976, all for final disposition of areas of unauthorized use. The three sales, all in Johnson County, have been completed.

The scattered and complex public land pattern throughout much of the resource area creates several management problems, but it also presents

good opportunities for land ownership adjustments. Most of the small, scattered parcels lack legal public access and provide few direct public benefits. Some are prone to trespass, and often the costs of detecting and terminating trespass, managing grazing use, and processing rights-of-way exceed the monetary return from such uses.

Management practices on larger or surrounding private lands often dictate the land use on isolated tracts. Disposal of lands could enhance private land management while allowing the BLM to intensify management on other tracts.

Exchanges serve several purposes, including "blocking" of lands (consolidating public land into manageable parcels rather than having scattered small tracts), complementing resource management programs by acquiring land with high resource values, and reducing management burdens. However, exchanges in the areas where land ownership is highly fragmented can be very difficult and at times of little public benefit, since the land offered by an exchange proponent is often isolated from other public land and contains no special resource values or management potential. In this case, a land sale would be preferred.

Two exchanges have been completed in the Buffalo Resource Area since 1976. One exchange of 180 acres of land surface acquired and 160 acres conveyed was recently completed in the Middle Fork Management Area (see map 6). The Buffalo Greenbelt R&PP exchange, which was completed in 1983, transferred 262 acres to the city of Buffalo.

The Homestead Act of 1863 and the Stock Raising Homestead Act of 1916 allowed homesteading and patenting of surface estates on mineral lands but reserved mineral estate to the United States. This created the "split estate" lands—privately owned surface over federal minerals.

Mineral exchanges can complement resource management programs by eliminating "split estate" situations or by protecting sensitive areas such as alluvial valley floors from mineral development.

Several coal exchanges are being processed, including the I-90 lease exchanges (see Glossary) and the Whitney Benefits alluvial valley floor exchange near Sheridan.

One or two R&PP applications are received each year. R&PP leases or patents are issued on roughly half of the areas applied for. Two R&PP parcels have been patented in Johnson County. The Buffalo Greenbelt (Section 3, T50N, R82W) covers 262 acres southwest of Buffalo. A second

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parcel of approximately 130 acres in Section 1, T50N, R83W (west of Buffalo) was patented to the county for a shooting range. R&PP leases have been issued for recreation complexes in Gillette (40 acres, Section 12, T49N, R72W) and Sheridan (560 acres, Section 14, T56N, R85W). These R&PP leases are shown on map 6.

Withdrawals

Withdrawals are a means of segregating or reserving use. A withdrawal also can transfer jurisdiction of a parcel or block of federal land from the BLM to another federal agency. Land withdrawals are important in supporting other resource programs.

The withdrawal program in the Buffalo Resource Area consists of reviewing existing withdrawals and recommending either retention or revocation. The various withdrawals in the resource area are shown on table 3-13. All withdrawals are approved or reviewed by the BLM, including withdrawals that benefit other agencies.

Existing withdrawals will be reviewed by 1991 to determine if they are still necessary and serving their intended purposes. Withdrawals that are no longer needed will be revoked, and new withdrawals will be pursued only in limited situations and if a need is made evident. FLPMA established a deadline of 1991 for completion of reviews of all withdrawals.

Access

Providing legal access through private lands requires acquisition of easements or cooperative agreements. Access generally is acquired in support of other resources; for example, for forest management or for a recreation program. Individual access easements will be acquired when public access to specific areas is needed for either general or specific uses. Easement acquisition is expected to remain stable at about three cases per year.

The BLM maintains five roads totaling approximately 33 miles in the resource area: Muir road (6112), Outlaw Cave road (6217), Billy Creek road (6207), the Weston West road (6507.1-2), and the Bar C road (6214). These roads are shown on map 6.

There are some permanent and temporary easements for timber harvesting in the Big Horn Mountains. A permanent easement also is in effect on the South Middle Butte of the Pumpkin

Buttes to aid establishment of the communications site (see map 6). These easements are not open to the public.

There is legal access to many of the larger tracts of public land via existing state or county roads, but access is not available to all public land. There is no legal access to most small, scattered tracts of public land in the resource area. Such parcels generally do not have resource values of sufficient public interest to justify acquiring an easement.

Permits and Leases

Permits and leases may be issued for a number of reasons and uses. Land and realty permits and leases are generally categorized according to purpose: habitation or occupancy; cultivation or agricultural uses; trade or manufacturing leases; or other land uses such as recreation concessions, research, and commercial use.

Permits and leases in the lands and realty program will be issued only if the proposed use cannot be authorized by other methods. There are two agreements for public travel through private lands in the Buffalo Resource Area: the Middle Fork Trail Road (6201.2) and Petrified Forest Road (6803). These are shown on map 6.

Several permits have been issued in the resource area, but they are of short duration so descriptions and locations are not given here. Most permits are short term and the turnover rate is rapid. No leases for realty actions have been issued, as there are numerous other authorization methods.

Unauthorized Use

Unauthorized land use consists primarily of trespass such as occupancy, agriculture, oil field roads, pipelines, and power distribution lines. Approximately seven unauthorized use cases are processed each year. The most frequent types of cases involve unauthorized oil field roads, pipelines, power lines, and agriculture.

Recreation

Recreation Opportunities

The Buffalo Resource Area offers diverse opportunities for several types of recreation, including hunting, fishing, ORV use, sightseeing, and wildlife observation. The major BLM recreation

Affected Environment

TABLE 3-13
WITHDRAWAL CLASSIFICATIONS IN THE BUFFALO RESOURCE AREA

Project or Type	County	Segregative Effect	Acreage	Administering Agency	Review Situation
Stock driveway	Johnson Sheridan	Prohibits surface entry ^a	± 24,000	BLM	reviewed 1983
Missouri River Basin Project	through-out resource area	Prohibits mineral location/surface entry	± 12,500	BOR	pending
Lake DeSmet	Johnson	Prohibits mineral location	80	BOR	pending review
Fort McKenzie	Sheridan	Prohibits mineral location/surface entry	± 4,930	DOD	pending review
Protective	Johnson Sheridan	Prohibits mineral location/surface entry	± 2,100	USFS	pending review
Roadside Administration and Recreation sites	Johnson Sheridan	Prohibits mineral location/surface entry	± 10,350	USFS	pending review
Administrative sites	Johnson Sheridan	Prohibits mineral location/surface entry	± 968	USFS	pending review
Experimental Ranges	Johnson Sheridan	Prohibits mineral location/surface entry	± 1,400	USFS	pending review
Youth Camp	Johnson	Prohibits mineral location	275	USFS	pending review
Protective Asden Creek game range	Sheridan	Prohibits mineral location/surface entry	± 630	BLM	pending review
Protective Ed. O. Taylor game range	Johnson	Prohibits mineral location/surface entry	± 11,000	BLM	pending review

ABBREVIATIONS: BOR = Bureau of Reclamation; DOD = Department of Defense; USFS = Forest Service

a "Surface entry" is occupying land, as in homesteading or using it for recreation and public purposes. Prohibition of surface entry does not prohibit grazing.

resources are primarily in the southern Big Horn Mountains and in the Powder River Breaks.

The southern Big Horns offer opportunities for excellent fishing and hunting, as well as sightseeing and camping. The snowpack can support snowmobiling and cross-country skiing for about four months each winter. Cultural resources, including some National Register sites, also are in this area.

The Middle Fork Recreation Management Area, in the southern Big Horns, covers approximately 48,400 acres and contains a variety of outstanding

natural resources. Wildlife in the area is extensive and diversified. The state of Wyoming rates the Middle Fork of the Powder River a Class I trout fishery; that is, one of national importance. Varied cultural resources related to the historic West add further significance.

The Red Wall and the area known as the Hole-in-the-Wall are outstanding natural landmarks. The entire area has high scenic quality. A portion of the Red Wall has been nominated to the National Register of Natural Landmarks.

Affected Environment



The Red Wall is the only location in the Buffalo Resource Area that has been designated an area of critical environmental concern (ACEC). The Red Wall boundaries extend into the Platte River Resource Area. In a recently released draft RMP/EIS for the Platte River Resource Area it was recommended that the ACEC designation be removed (USDI, BLM 1984b). The Buffalo Resource Area concurs with that recommendation. Occupancy restrictions already in effect adequately protect the area.

The Powder River Breaks are nationally known for big game hunting. Hunters come to the area from throughout the continental United States.

The Dry Creek Petrified Tree Environmental Education Area (40 acres) has been designated as an outstanding natural area. Development of the site for environmental education began in 1982 with the construction of a trail and parking area. It is expected that the site will be fully functional by 1985 with the addition of interpretive signing and visitor facilities.

The three WSAs contain excellent features conducive to primitive types of recreation. Big game hunting and camping are available in all three WSAs, but there is no public access to North Fork and Fortification Creek WSAs. Access to Gardner Mountain WSA, although possible, is difficult because of the scattered land ownership pattern. Fishing is available in both Gardner Mountain and North Fork WSAs.

Visitation

Over the past several years, use of the public lands by visitors has increased greatly in the resource area. This increased use, which has been directly associated with the "energy boom" in the northeast quadrant of the state, is estimated to be as much as 10 to 15% per year in designated recreation areas. Visitation in each of the WSAs is fewer than 500 visitor days per year.

The abundance of big game, an adequate water supply, and wide open spaces all attract visitors to the entire resource area. This leads to heavy recreation pressure, which is compounded by the fact that more than 70% of the land in the resource area is privately owned and therefore not available for the recreating public.

The demand for public access to public lands is expected to continue. Increases in use by visitors will be primarily due to the demand for hunting, fishing, and camping. See table 3-14 for use projections.

TABLE 3-14
ESTIMATED 1980 VISITS
TO THE BUFFALO RESOURCE AREA
FOR OUTDOOR RECREATION
WITH PROJECTIONS FOR BENCHMARK YEARS

Visits by Wyoming Residents			
1980 ¹	1985 ²	1990 ²	1995 ²
280,000	350,000	420,000	520,000
Visits by Nonresidents of Wyoming			
1980 ¹	1985 ²	1990 ²	1995 ²
180,000	190,000	200,000	210,000

¹Based on Forest Service, state, and BLM estimates of recreational use and an unpublished study by the Casper District, BLM.

²Based on the 1980 level of visits per 1,000 state population as applied to state population projections. In those projections, it was assumed that state populations would grow at the same average annual rate as in the 1970-1980 period.

³Based on the 1980 level of visits per million United States population, as applied to United States population projections. In these projections, it was assumed that the United States population would grow at the same average annual rate as in the 1970-1980 period.

Affected Environment



Courtesy of Wyoming Travel Commission

Regional Setting

Many of the general dispersed recreation opportunities available in the Buffalo Resource Area are available elsewhere in the region. Other private and state lands and the Bighorn National Forest offer plentiful and diverse opportunities for activities such as hunting, fishing, camping, sightseeing, and general leisure.

Although Grand Teton and Yellowstone national parks are located in northwest Wyoming, they still play a major role in the regional recreation setting. Tourists traveling U.S. Highway 16 enroute to or from these parks often spend several hours or even days in the Buffalo Resource Area. Many tourist-related businesses in the resource area cater to these travelers.

A more detailed account of the types of facilities and intensity of recreation use in the region can be found in the Wyoming Statewide Comprehensive Outdoor Recreation Plan (Wyo. Rec. Com. n.d.).

Recreation Management

The goals of recreation management are (a) to ensure availability of outdoor recreation opportunities sought by the public that are not readily available from other public or private sources and (b) to protect resources, meet legal requirements for visitor health and safety, and mitigate resource use conflicts involving recreation.

Approximately 512,000 acres of public land in Johnson County has been inventoried and designated as open, limited, or closed to ORV use. The

Affected Environment

designations are the result of land use planning decisions in the 1979 management framework plan for the Buffalo Resource Area. No designations have been made for ORV use in Sheridan and Campbell counties. The designations in Johnson County limit ORV use on most public lands to existing roads. However, most public land is still open to use by oversnow vehicles. Table 3-15 details the ORV designations.

The resource area issues an average of three recreation use permits per year. These are associated primarily with hunting and include hunting camps and bear baiting. An annual increase of approximately six permits is anticipated beginning in 1984 in response to new policy for recreation on public lands. In the past, the Buffalo Resource Area has issued a snowmobile race permit annually in conjunction with the Forest Service.

The recreation resource will be evaluated case by case as part of all activity and project planning. These plans will consider impacts to the recreation resource resulting from project development. If necessary, special stipulations mitigating these impacts will be attached to assure compatibility of projects with recreation management objectives.

Regular on-site monitoring of designated recreation areas will continue to be carried out during peak use seasons. Special uses of the public lands for recreational purposes (for example, large organized events or guided trips by commercial outfitters) will be managed through the use of the permit system.

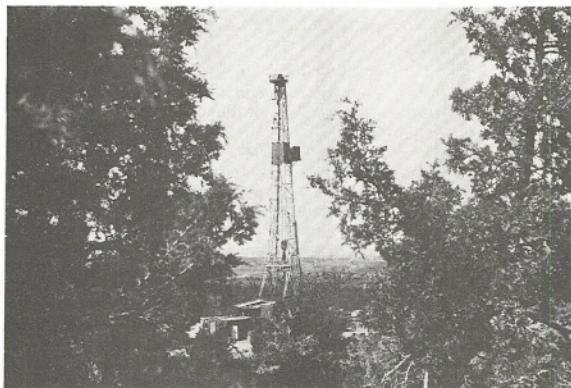
The BLM will continue to provide a broad range of dispersed recreational opportunities. However, priority consideration for management attention will be given to areas of high use, areas with access problems, and large blocks of public lands. Support facilities will be developed only when resource protection and recreational demands warrant such activities, and development will be based upon recreation area management plans.

MINERAL RESOURCES

Background

The Buffalo Resource Area contains some of the largest economically recoverable deposits of coal, oil and gas, and uranium in the United States. About 77% of the minerals in the resource area are federally owned (64% on BLM-administered lands and 13% on other federal lands). These mineral resources are critical to local economies and play a major role in the regional and national economies. Approximately 32% of the employed persons in the resource area work in the minerals industry.

Minerals fall into three categories: leasable, locatable, and salable. Leasable minerals are those that may be acquired under the Mineral Leasing Act of 1920, as amended. The major



Affected Environment

TABLE 3-15
ORV DESIGNATIONS
PUBLIC LAND IN JOHNSON COUNTY

	<u>Acreage</u>	<u>Total Acreage</u>
I. Open Areas ^a --Vehicle travel is permitted both on and off roads if the vehicle is operated responsibly in a manner unlikely to cause significant undue damage to the environment.		
Stock driveway and rests Powder River and south of I-90	16,746 3,640	20,386
II. Closed Areas ^a --Travel by vehicles, including snowmobiles is prohibited in the following areas:		
Middle Fork Canyon 6 miles southwest of Barnum Cantonment Reno 20 miles northeast of Kaycee Dry Creek Petrified Tree EEA 9 miles east of Buffalo	3,038 572 40	3,650
III. Limited Areas A--Use is limited to roads and vehicle routes in existence as of the date of this publication.		326,187
IV. Limited Areas B--Use is limited to designated roads and vehicle routes within the following areas. (Until maps are issued and signs posted, vehicle travel is limited to existing roads and vehicle routes.)		
North Fork of the Powder River 10 miles northwest of Mayoworth Gardner Mountain Area 10 miles north of Barnum, including the Gardner Mountain WSA	16,453 28,832	
Red Wall from near Barnum to the county line	5,442	
Middle Fork Management Area	30,640	
Petrified Forest north of the Dry Creek Petrified Tree EEA	427	
Fortification Creek Area, including portions of the Fortification Creek WSA	22,337	
Powder River Breaks 26 miles east of Buffalo north and south of I-90 near the Powder River	19,427	
Sections of the Bozeman Trail in central and southern Johnson County	645	
V. Limited Areas C--Vehicle travel is closed to all motor vehicles including snowmobiles from December 1 to April 15.		
North Fork of the Powder River area 10 miles northwest of Mayoworth, including portions of the North Fork WSA	16,432	
Land on Barnum Mountain, 6 miles west of Barnum	2,800	
A portion of the Middle Fork Management Area 12 miles southwest of Barnum	6,800	
Land in Fortification Creek Area, in- cluding a portion of the WSA	11,614	
Johnson County total		<u>37,646</u>
		387,869

a. Also see "Off-road Vehicle Designations" in the Glossary.

Affected Environment

Leasable minerals in the Buffalo Resource Area are oil and gas and coal. Locatable minerals, for example, gold, silver, and copper, are covered by the Federal Mining Law of 1872. Salable minerals such as sand, gravel, flagstone, and scoria may be sold under the Material Sale Act of 1947, as amended.

Policy and Goals

The goal of the minerals management program is to make federal lands available for minerals exploration and development while balancing other multiple resource use objectives.

The BLM's management of mineral and energy resources on public lands is guided by the following principles.

Except for congressional withdrawals and requirements of public law (for example, WSAs), public lands will remain open and available for mineral exploration and development unless withdrawal or administrative action is clearly in the national interest.

The BLM encourages development by private industry of public land mineral resources in a manner that satisfies national and local needs. However, provisions must be made for economically and environmentally sound extraction, and for reclamation.

The BLM will process mineral applications, permits, leases, and other use authorizations for public lands in a timely and efficient manner.

The RMP will recognize that mineral activity can occur concurrently with other resource uses. The BLM will update decisions as new data are evaluated.

The RMP will reflect geology, energy, and mineral values on public lands through more effective assessment of mineral resource data.

The BLM will maintain personnel with knowledge of mineral exploration and development.

Leasable Minerals

Coal, oil, gas, oil shale, phosphates, trona, sulfur, and potassium are examples of leasable minerals. The only economically recoverable leasable minerals in the Buffalo Resource Area are coal, oil, and gas.

Private industry is encouraged to explore and develop federal minerals to satisfy national and local need. This policy provides for economically and environmentally sound exploration, extraction and reclamation practices. Public lands are open and available for mineral exploration and development unless a given area is withdrawn or administratively restricted. Programs to obtain and evaluate current energy and mineral data are encouraged.

Coal

Background

The Powder River Basin in Wyoming contains some of the largest accumulations of subbituminous coal reserves in the world. Most of this coal is in the Buffalo Resource Area. The coal is centered in two general zones: a north-south oriented zone in Campbell County in which the major producing seams, the Anderson and Canyon, combine in place to form the Wyodak seam; and an area north of Sheridan near the Montana state line in which the major producing seams are the Monarch and Dietz.

About 90% of the total coal reserve in the Buffalo Resource Area is federal coal. The Powder River Coal Region differs from many other coal regions in that it is 85% to 90% "split estate"; that is, privately owned surface over federal coal. For this reason, many mitigating measures used in coal regions where most of the surface is federal do not apply in this region.

Appendix 8 lists the coal-related development and other energy-related projects in the Buffalo Resource Area.

There are 13 producing coal mines and 15 nonproducing coal mines in the Buffalo Resource Area. Most of these projects are concentrated in two areas: north of Sheridan and on a strip beginning about 20 miles north of Gillette and extending southward along the east side of Wyoming Highway 59 the length of Campbell County. Mine locations are displayed on map 8. About 8 billion tons of federal coal in about 127,000 acres is committed via coal lease. This includes the tracts that were sold in the 1982 coal lease sale.

Preference Right Lease Applications

A total of 52 PRLAs encompass about 76,000 acres containing about 6 billion tons of coal. This includes the PRLAs in the Thunder Basin National Grassland in Campbell County. Table 3-16 details the PRLAs in this area.

TABLE 3-16
PREFERENCE RIGHT LEASE APPLICATIONS IN THE BUFFALO RESOURCE AREA

PRLA Serial Number	Project Name and Location	Applicant	Acreage	Tonnage (million tons)	Comments
W-3818 W-3819	Ulm Project Sheridan County	Fred C. Woodson	5,519	99	
W-8307 W-8308 W-8309 W-8310 W-8311 W-8312 W-11128	Wildcat Project Campbell County	Consolidation Coal Company	13,784	620	
W-24984 W-24985 W-26198 W-26199 W-32061 W-32062		Pebbody Coal Company	5,129	45	Rejected and appealed
W-87204	Cabello Project Campbell County	Carter Mining Company	480		
W-9036	Belle Fourche Project Campbell County	John Wold	80	37	Rejected Not calculated in total figures

PREFERENCE RIGHT LEASE APPLICATIONS IN THE BUFFALO RESOURCE AREA
(continued)

PRILA Serial Number	Project Name and Location	Applicant	Acreage	Tonnage (million tons)	Comments
W-16876	East Black Thunder Project Campbell County (part in TBNG ^a)	ARCO (Anaconda)	80		Added into total for the Buffalo Resource Area
W-25717 W-25718 W-32064 W-32065 W-32068	Rochelle Project Campbell County (part in TBNG ^a)	Peabody Coal Company	2,324	39.1	Added into total for the Buffalo Resource
W-25719 W-32067 W-60638	North Antelope Proj., Campbell County (part in Converse County, part in TBNG ^a)	North Antelope Coal Company (Peabody)	880	27.5	Added into total for the Buffalo Resource Area
W-1598 W-1599 W-2275 W-4995 W-4996 W-56843 W-56844 W-56845 W-58482 W-58483 W-58484 W-58485	Western Fuels Association, Inc.		23,927	238	

PREFERENCE RIGHT LEASE APPLICATIONS IN THE BUFFALO RESOURCE AREA
 (continued)

<u>PRLA Serial Number</u>	<u>Project Name and Location</u>	<u>Applicant</u>	<u>Acreage</u>	<u>Tonnage (million tons)</u>	<u>Comments</u>
W-1595		John Wold and Page Jenkins	23,889	4,600	In situ and open pit recovery
W-1596					
W-1597					
W-2273	Thunderbird II				
W-2274	Project				
W-2276	Campbell and				
W-4997	Johnson counties				
W-4998					
W-16313					
W-59444					
W-59461					
W-59463					
W-59464					
Total			76,092	5,705.6	

*Thunder Basin National Grassland

Affected Environment

PRLAs arose from the Mineral Leasing Act of 1920, which enabled applicants to acquire rights to federal coal through the Government Land Office (now the BLM). Permittees who could demonstrate that areas in which they had prospecting permits contained commercial quantities of coal were entitled to a "preference right lease"—that is, a noncompetitive lease—provided the coal could be developed economically in an environmentally sound manner. Provisions for these prospecting permits were repealed in 1976, but current federal coal regulations (43 CFR 3430) provide for processing of pending PRLAs. In this plan, PRLAs are treated as uncommitted federal coal.

The preference right lease applicant prepares a detailed report called an initial showing, which describes the quality of the reserves and details the proposed operation. After receiving the initial showing, the BLM prepares an EA to evaluate alternatives and establish mitigative measures for protection of environmentally sensitive areas or other resource values.

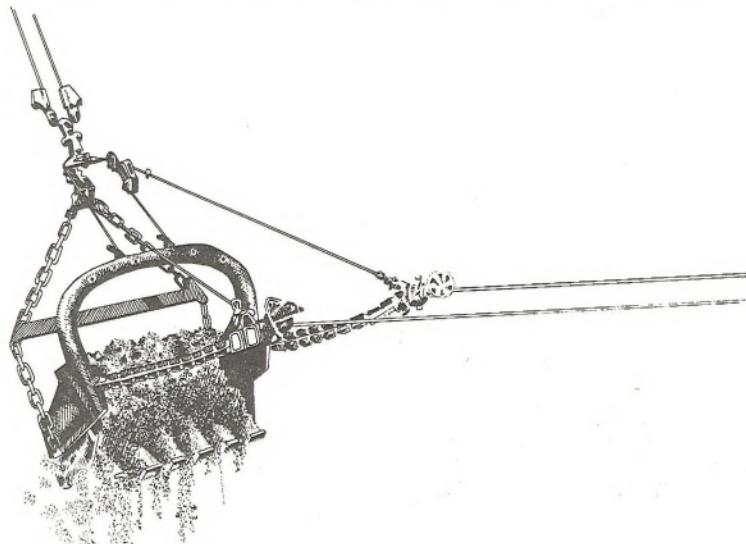
The BLM has determined that an EIS is necessary to consider the cumulative impacts of potential PRLA leasing. The EIS is scheduled for completion in 1985. Applicants will be asked to submit their

final showings after the EIS has been completed. The final showings will then be evaluated and a decision will be made for each either to issue a coal lease to the applicant or to reject the PRLA for lack of proof of commercial quantities of coal.

Coal Planning

The Buffalo Resource Area is responsible for identifying, through the planning system, federal coal land available for further consideration for leasing and exchange. Additionally, coal exploration licenses are processed in the resource area as outlined in the federal coal regulations (43 CFR 3410). The existing and projected rate of processing these licenses is seven per year.

Before federal coal can be considered for leasing it is subject to a five-step screening process. First, a call is issued for coal resource information; second, coal lands that have potential for coal development are defined; third, the unsuitability criteria of the federal coal management program must be applied; fourth, a multiple use analysis of the area must be done; and fifth, there must be consultation with the surface owner. Appendix 2 details the screening process and its application in the Buffalo Resource Area.



Affected Environment

Table 3-17 summarizes the results of the coal planning process and presents data for all committed and uncommitted coal in the Buffalo Resource Area.

Federal coal land where the coal screening process has been completed is shown on map 8. All federal coal land identified as available for further leasing consideration within those boundaries could be considered in a future coal lease sale. Before mining could occur, these acceptable areas would be narrowed down through a series of steps, as follows:

Industry expresses an interest in leasing certain areas.

The BLM delineates tracts that might be offered for leasing.

A site-specific analysis of each tract is prepared.

Tracts are ranked according to their high, moderate, or low desirability for coal development.

The Powder River Regional Coal Team selects tracts to be offered for sale and schedules the sale.

The BLM prepares a regional coal leasing EIS.

The lease sale is conducted.

TABLE 3-17
SUMMARY OF FEDERAL COAL
IN THE BUFFALO RESOURCE AREA

	Acreage	Subtotals	Billions of Tons	Subtotals
<u>Committed Federal Coal</u>				
Existing leases	113,000		7	
Leases resulting from 1982 coal lease sale	<u>14,000</u>		<u>1</u>	
Total existing and 1982		127,000		8
<u>Uncommitted Federal Coal (delineated)</u>				
Preference right lease applications	75,000		6	
Tracts available for second round lease sale	44,000		3	
Tracts not selected for second round lease sale	<u>51,000</u>		<u>3</u>	
Total PRLAs, second round, and not selected		170,000		12
Federal coal with development potential (not delineated)	1,844,000		109	
Plus delineated uncommitted coal (from above)	<u>170,000</u>		<u>12</u>	
<u>TOTAL UNCOMMITTED FEDERAL COAL</u>		2,014,000		121
Less federal coal eliminated by application of unsuitability criteria	(145,000)		(9)	
Total uncommitted federal coal available for multiple use analysis	1,869,000		112	
Less federal coal eliminated by multiple use analysis	(221,000)		(23)	
Remaining uncommitted federal coal available for further leasing consideration ^a	1,648,000		89	

a. This figure does not contain unavailable acreages and tons where land use planning constraints could be lifted, such as in known geologic structures.

Affected Environment

Coal Lease Sales

The first Powder River coal sale under the new federal coal leasing program was held in April 1982. Six coal tracts were sold after being subjected to the coal activity planning process and after environmental assessment. The 1982 sale removed 13,783 acres containing 1.198 billion tons of coal from the total amount that was available in the resource area.

Activity planning for the second Powder River coal lease sale was initiated in August 1982. In preparation for this lease sale, the Powder River Regional Coal Team, which is made up of federal, state, and local officials, selected tracts to be considered for the lease sale and grouped them into alternative leasing levels. A draft EIS was then prepared to analyze the consequences of each alternative. The draft EIS was made public in January 1984. A final EIS will be prepared after a public comment period.

After the final EIS is prepared, the regional coal team will make recommendations to the director of the BLM as to which tracts should be offered in a possible lease sale. The director forwards the recommendations of the team, along with his own recommendations, to the Secretary of the Interior, who makes the final decision on which tracts and how many will be offered. He may, at his discretion, select for leasing any combination of tracts analyzed in the EIS.

The Powder River Regional coal team selected 11 tracts containing about 3.5 billion tons in the Buffalo Resource Area to be considered in the second round Powder River coal sale EIS (USDI, BLM 1984a). The preferred alternative in that EIS recommends that eight of the tracts be available in the second round Powder River Region lease sale. These tracts, which contain about 1.9 billion tons of coal, are identified in table 3-18. Two of these tracts would be maintenance tracts for existing coal mining operations.

Table 3-18 also lists the federal coal tracts that have been delineated in the coal activity planning process but were not selected for inclusion in the second Powder River lease sale.

Eleven new expressions of interest were received for the second Powder River sale, and 12 from the 1982 sale were "recycled" by the regional coal team. From those expressions, 23 tracts in the Powder River Basin containing 6.5 billion tons of coal were delineated. From that group, the regional coal team selected 11 tracts to be considered for leasing in the Buffalo Resource Area. The combined total tonnage of the 11 tracts in the Buffalo Resource Area is about 3 billion tons.

Concern has been expressed that the entire amount of federal coal available for leasing consideration might be offered in one sale. Before the 1982 coal lease sale, 17 expressions of interest were received. As a result of those expressions, 15 coal tracts encompassing about 5 billion tons of coal were selected for the sale. Only six of those tracts—1.1 billion tons of coal—were sold.

Past leasing action indicates that the probability of leasing large tonnages in one sale is extremely low. The primary reason for this is the federal coal system itself. With state government represented on the regional coal team, impacts of federal programs on local communities are closely monitored and controlled.

Another reason that large quantities would not be offered relates to industry. The coal industry is under strict development guidelines, and companies simply cannot afford to lease billions of tons of coal reserves with no thought of producing that coal. For this reason, once a company has sufficient reserves to protect investments, it is not likely to express interest in leasing again for many years. If all existing operations have sufficient reserves, then demand (as reflected by expressions of interest) will probably decline.

The chances of a large sale occurring are further diminished by the fact that much of the demand will have been satisfied by the first and second round Powder River sales. Until the 1982 sale, there had been no new coal leasing in the Powder River Region for nearly 20 years. Many companies whose reserves were extremely low were eager to lease coal.

Coal Exchanges

Public Law 95-554 of October 30, 1978, directs the Secretary of the Interior to consider exchanging specific coal leases along Interstate Highway 90. Seven leaseholders were affected by this law. Three exchanges have been completed. The Belco, Kerr-McGee, Gulf Oil, and Big Horn applications for exchanges have not been completed. In addition, a possible exchange is being analyzed for federal coal land contained in an alluvial valley floor in Sheridan County.

Projections

In this plan it has been assumed that emphasis would be placed on maintaining existing coal mines, eliminating coal bypass situations, and processing applications such as PRLAs and exchanges.

TABLE 3-18
COAL TRACTS IN THE BUFFALO RESOURCE AREA

Coal-Tracts Selected for the Second Powder River Lease Sale

Tract	Coal Ownership (acres)					Recoverable Reserves (millions of tons)					Companies Expressing Interest
	Federal Uncommitted	Federal Committed	State	Private	Total	Federal Uncommitted	Federal Committed	State	Private	Total	
<u>Wyoming</u>											
Youngs Creek	3,310		640	635	4,585	388		53	94	535	Coastal States Energy; Ash Creek; Shell; Basin Electric; Central and South-western Fuels; Western Fuels
Hidden Water Calf Creek	6,285 6,010	360	640 640	1,960 40	8,885 7,050	163 694	16	100 28	19 3	282 753	Peter Kiewit and Sons Shell; U.S. Steel; Old Ben; Texaco; Mobile
Hay Creek	5,250		120		5,370	447		16		463	Old Ben; Texaco; Mobile; Peter Kiewit and Sons
Donkey Creek	600	700	640		1,940	49	75	4		128	Wyodak Resources Development Company
Timber Creek	3,350		400		3,750	165			9	174	Bridgeview Coal Company
Mount Logan	6,165		640		6,805	410		42		452	U.S. Steel; Exxon; Gulf
Kiowa Creek	4,080		120		4,200	282				284	Wyo; NERCO, Inc.; Exxon; Gulf; U.S. Steel; Shell
Thundercloud Porcupine ^a	3,845 560	160	640	40	4,525 720	445 26	13	78	5	528 39	Anaconda Mining Company North Antelope Coal Company; Rochelle Coal Company
Ridgerunner ^a	4,610		720		5,330	415		25		440	NERCO, Inc.
Total	44,065	1,220	4,680	3,195	53,160	3,484	104	346	130	4,078	

Affected Environment

Delineated Coal Tracts Not Selected for the Second Powder River Lease Sale

Bitter Creek	3,930		640	140	4,710	305		51	12	368
Ash Creek	7,539		80	160	7,779	503		5	22	530
Twenty Mile Butte	7,838		680	80	8,598	129		28	2	159
Scotty Draw	8,558		40		8,598	258		2		260
Kumor Draw	3,282			760	4,042	92			103	195
Wildcat	3,965		40		80	4,085	285		.5	.5
Rockpile	4,585		360		640	5,585	402	16	28	446
Roundup ^a	5,250			640		5,890	401		40	441
Rochelle Hills	5,905		720			6,625	502	61		563
Total	50,852	1,120	2,080	1,860	55,912	2,877	77.5	126	167.5	3,248

NOTE: Further information is available in Powder River Coal Region Tract Summaries (USDI, BLM 1983).

^as. Tracts in Thunder Basin National Grassland.

Affected Environment

The demand for coal beyond 1985 is difficult to predict with certainty because so many variables can influence demand. The industry has continued to express a significant level of interest in leasing federal coal in the Buffalo Resource Area even in the face of the present "soft" coal market and some indication of a decrease in the market demand for reserves. Thus, the second assumption made is that federal coal in the resource area that is available for competitive leasing would be required to meet any additional coal demands.

Areas where the major problems occur in relation to federal coal deposits in the resource area can be defined. For example, significant environmental problems related to coal development probably would occur in northern Campbell County, and in much of Sheridan and Johnson counties, for which coal information is poor or nonexistent. Emphasis should be placed on acquiring information for future coal activity planning in those areas. Drilling data could be obtained from exploration permits, from existing industry data, or from information gathered in BLM drilling programs.

The coal quality in parts of Sheridan and Johnson counties is potentially very good, and reliable quantitative information is essential for maintenance of a viable coal leasing program in that part of the Buffalo Resource Area.

Other factors such as availability of production and shipping facilities, favorable economies for development, high industry interest, and a decrease or lack of environmental and land use problems could be used to assign priority to competitive leasing areas.

On the basis of these factors, we can predict two areas where subsequent development is likely to occur. Those areas are in Campbell and Sheridan counties, specifically north central Sheridan county and central Campbell County.

Oil and Gas

Resources and Production

Public land administered by the BLM is available for oil and gas leasing, exploration, and development, subject to limitations imposed by law and by standard terms and conditions and stipulations formulated to protect other resource values. For example, by law and regulation, approximately 800 acres of federal minerals underlying incorporated cities and towns cannot be leased.

The Buffalo Resource Area contains 236 oil and gas fields with 2,272 producing wells. A total of 25,420,720 barrels of oil and 27,558,280 thousand cubic feet (mcf) of gas was produced in 1982. Production by county for 1982 is listed in table 3-19. Distribution of oil and gas mineral estate is shown on table 3-20. Estimated reserves are shown in table 3-21.

Oil and gas fields in the Buffalo Resource Area produce from horizons ranging in age from Mississippian to late Cretaceous. The Campbell County portion of the resource area was second in the state in the number of oil and gas wells drilled in 1981. The resource area as a whole accounts for a significant percentage of the state's total production, having contributed 21% of the crude oil and 6% of the natural gas to Wyoming's total output in 1982 (Wyo. Oil and Gas Comm. 1982a).

A total of 600 new producing wells were located on public oil and gas estate in the resource area from 1977 through 1981. Approximately 240 wells are drilled on federal oil and gas estate each year in the resource area. Of these, about 120 (50%) prove productive. This current rate of development is expected to continue.

A total of 517 wells were drilled in the three counties of the Buffalo Resource Area in 1982, of which 240 (46%) were on federal oil and gas estate—48 (9%) on public surface and 192 (37%) on private surface ("split estate"). The remaining 277 (54%) wells were on private and state surface and minerals. This distribution roughly correlates with the 11% public surface and 42% federal oil and gas estate (including both private and public surface lands) in the Buffalo Resource Area.

Oil and Gas Activity

On an average, development of a well site, including drill pad and facilities, disturbs from 3 to 8 acres. The acreage disturbed depends on the location and depth of the well. About 1 acre-foot of water is needed to drill 3,000 feet of depth for an oil well. The average well depth in the resource area is 8,500 feet; therefore, water consumption per well is about 2.8 acre-feet, or approximately 912,382 U.S. gallons.

Additional ongoing surface-disturbing projects associated with oil and gas production in the Buffalo Resource Area are 72 water injection projects, 1 gas injection project, 1 air injection project, 1 gas storage project, 31 water disposal systems, and 4 tertiary oil recovery projects.

Affected Environment

TABLE 3-19
OIL AND GAS PRODUCTION
IN THE BUFFALO RESOURCE AREA

County	Number of Fields	Producing Wells	Oil (barrels)	Gas (mcf) ¹
Campbell	201	1,712	22,392,939	25,644,290
Johnson	30	521	2,797,302	1,784,270
Sheridan	5	39	230,529	129,720
Total	236	2,272	25,420,770	27,558,280

¹mcf = thousand cubic feet.

TABLE 3-20
DISTRIBUTION OF OIL AND GAS ESTATE
(area in acres)

County	Total Acreage	Federal Oil and Gas Estates	Percentage of of Total	State or Private Oil and Gas Estate	Percentage of Total
Campbell	3,043,840	1,830,120	60	1,213,720	40
Johnson	2,674,560	934,645	35	1,739,914	65
Sheridan	1,620,480	285,658	18	1,334,822	82
Total	7,338,880	3,000,924	41	4,337,956	59

Source: Bureau of Land Management, Wyoming State Office, Records and Data Management.

Affected Environment

TABLE 3-21
OIL AND GAS RESERVES IN THE BUFFALO RESOURCE AREA

	Oil (barrels)	Gas (thousand cubic feet)
<u>Ultimate Production in Buffalo Resource Area^a</u>		
Campbell County	569,243,159	652,356,807
Johnson County	224,960,564	127,681,490
Sheridan County	15,426,959	9,462
<u>Remaining Proven Reserves^b</u>		
Campbell County	218,792,281	139,607,645
Johnson County	41,148,384	11,589,874
Sheridan County	2,037,434	224,000
<u>Estimated Remaining Reserves for Entire Powder River Basin</u>	685,900,000	430,200,000
<u>Estimated Undiscovered Resources in Powder River Basin</u>		
Smallest quantity	528,000,000	541,000,000
Most likely quantity	1,174,000,000	1,204,000,000
Largest quantity	2,935,000,000	3,010,000,000

SOURCES: Data on ultimate production, remaining proven reserves, and estimated remaining reserves for Powder River Basin from Barlow and Hahn, Inc., Oil and Gas Production, Reserves, and Resources in Wyoming (Casper, WY: Barlow and Hahn, Inc., 1978, prepared for the Minerals Division, Wyoming Department of Economic Planning and Development).

a. Includes past and future production.

b. Based on known resources.

Seismic activity in the resource area for 1983 on both private and federal surface is as follows: Campbell County, 2,604 miles of seismic lines and 26,152 shot holes; Johnson County, 531 miles and 5,214 shot holes; Sheridan County, 124 miles and 1,940 shot holes.

The tri-county area accounted for 45% of total miles surveyed and 38% of all shot holes drilled in Wyoming in 1983. (Information is from the Wyoming Oil and Gas Conservation Commission.) Since 8% of Campbell County, 19% of Johnson County, and 3% of Sheridan County is BLM-administered land, it is estimated that 313 miles and 3,141 shot holes were on public land.

Management of Oil and Gas

The BLM processes applications to conduct geophysical exploration, commonly known as notices of intent. The Buffalo Resource Area received 117 applications for geophysical explor-

ation lines that would cross federal surface in the resource area in 1982. Compliance inspections are conducted on geophysical exploration lines annually.

Work in the oil and gas program is completed on a priority basis as established by annual work plan directives. Generally speaking, oil and gas leasing have top priority, followed by processing applications for permit to drill, sundry notices and change of plans, notices of intent for seismic operations, notices of completion, and compliance inspections on producing and abandoned well locations.

Approximately 280 APDs for federal oil and gas were filed in the resource area in 1982, with about 550 simultaneous lease offers and 25 competitive oil and gas leases issued annually. Oil and gas leasing procedures are described in the Buffalo oil and gas environmental assessment (USDI, BLM 1980b).

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Standard terms and conditions may be applied to federal lands proposed for oil and gas leasing and development. These terms and conditions mitigate effects on other resources and comply with laws (see appendix 4). In addition to the standard requirements, specific guidance has been developed for surface-disturbing activities in this resource area through various instruction memorandums and plans.

The BLM regularly monitors producing wells to see that throughout the production period each operator abides by standard BLM terms, conditions, and stipulations for resource protection. If a well is a dry hole, the operator proceeds with rehabilitation of the drill site and access road. The BLM periodically conducts compliance inspections on federal surface, or where off-site damage might affect federal surface, to check the progress of rehabilitation. Approximately 90 inspections of producing wells and 300 inspections on the rehabilitation of dry holes are made in the resource area each year. Other compliance inspections also are performed during production.

Leasable Minerals in WSAs

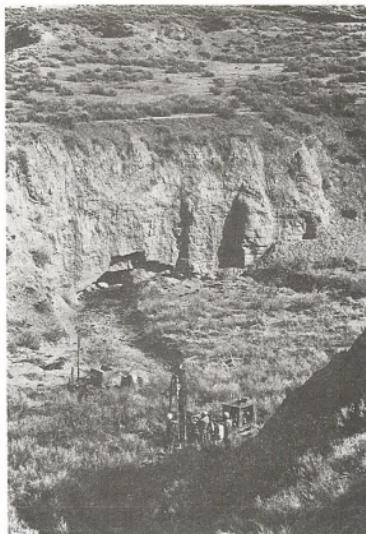
There is no evidence of any critical energy or mineral resources in the Gardner Mountain WSA or the North Fork WSA. Fortification Creek WSA contains an estimated 50 million tons of stripable coal with development potential beneath 960 acres of public land, but the amount is considered insignificant in comparison with the total coal reserves in the area. Other coal in the Fortification Creek WSA is too deep for strip mining. Appendix 7 contains a detailed discussion of the WSAs.

Locatable Minerals

Resource Area Locatables

Bentonite and uranium are the two most important locatable minerals found in the resource area. There are a number of mining claims for precious metals such as gold and silver; however, no significant deposits are currently known.

Bentonite in economic deposits is found near the flank of the Big Horn Mountains in southern Johnson County. It has been mined in this area since the 1960s or earlier, and production continues. Production (both federal and private) has been as high as 241,000 tons per year. Actual reserves of bentonite are unknown.



The actual amount of recoverable uranium is likewise unknown, but southeastern Johnson County and southwestern Campbell County are known to contain some of the most significant uranium deposits in the region. Uranium ore production (both federal and private) in the resource area in 1979 amounted to 110,000 tons. Uranium production ceased in 1981 because of depressed market conditions.

Traces of metallic and rare earth minerals are found within rocks of Precambrian age, primarily along fault zones or dikes, or both. Prospecting for metals other than uranium in the past has been primarily for gold, silver, copper, and nickel.

No economic deposits of strategic minerals (see Glossary) have been found in the Buffalo Resource Area, but trace amounts may exist.

Locatable Minerals in WSAs

There are no known or suspected deposits of locatable minerals in economic quantities in any of the WSAs in the Buffalo Resource Area, and as of October 1, 1983, no mining claims had been filed for minerals in any of the WSAs. Appendix 7 contains detailed descriptions of the WSAs.

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Management of Locatable Minerals

The Buffalo Resource Area receives notices of intent and processes plans of operations under the 43 CFR 3809 regulations. It also conducts compliance inspections. The 3809 regulations prohibit unnecessary and undue degradation of the environment. Six notices of intent were received and no plans of operation were processed in the resource area in fiscal year 1983. The case load is expected to remain stable. Notices concerning bentonite pertain to southwestern Johnson County, and those concerning uranium pertain to the Pumpkin Buttes area of southeastern Johnson and southwestern Campbell counties.

The Wyoming State Office of the BLM handles all mining claims, filings, and patent applications on BLM minerals throughout the state. There were 21,369 mining claims on locatable minerals in the Buffalo Resource Area in 1983.

Claims can be filed on such minerals as gold, silver, lead, copper, zinc, bentonite, and uranium. Upon proof of mineral discovery and after fulfilling other legal requirements, claimants may obtain a patent on the minerals and on the surface estate if it is federally owned.

Specific BLM-administered areas that are withdrawn from mineral location are the Amsden Creek big game winter range and part of the Ed O. Taylor Game Range (see map 10). Approximately 12,000 acres of BLM-administered land in the Buffalo Resource Area are closed to mining under the 1872 mining law. Sites administered by agencies other than the BLM are listed in table 3-13.

Salable Minerals

Resource Area Salable Minerals

Sand and gravel are the major salable minerals found in the resource area. Others are flagstone, scoria, and crushed rock such as limestone. Sand and gravel are the major or construction materials found in the resource area. The deposits are concentrated along major drainages, but they are scarce or absent in much of the northeastern and eastern parts of the resource area. Scoria, which is used extensively as a substitute for sand and gravel, is used primarily for road construction.

Estimated amounts of economically recoverable salable minerals on the federal mineral estate in the resource area are 112,215,000 cubic yards of sand and gravel, 431,634,000 cubic yards of scoria, and 16,556,000 cubic yards of limestone.

Annual production figures for salable minerals in the resource area, including both federal and privately owned materials, are as follows: scoria, 685,000 cubic yards; sand and gravel, 724,000 cubic yards; and limestone, 43,415 cubic yards.

Management of Salable Minerals

Applications for the removal of mineral materials are processed upon receipt. Stipulations to protect surface and mineral values are attached after review of each proposal. Mineral materials have been in considerable demand in recent years, in proportion to the increase in development of energy materials.

At any given time, there are approximately 40 permits (free use permits and material sales), representing between 500,000 and 1.5 million cubic yards of mineral materials in the resource area. Actual annual production is usually less than half of that under permit.

Material sites average approximately 3 acres, and sites may be active under various (or successive) permits for one to ten years. Extraction of mineral materials may disturb as much as 20 to 30 acres annually in the resource area.

Site reclamation is initiated after the mineral material is removed. Free use permits, which are issued primarily to state and county highway departments, account for about half the annual disposal volume. The other half is disposed of through competitive mineral material sales. Materials disposed of through competitive sales are used primarily in roads and facilities constructed in conjunction with development of energy minerals.

SOIL RESOURCES

Soils

Resource Area Soils

Soil information for the Buffalo Resource Area was derived from SCS generalized county soils maps. The mapping unit delineations were derived primarily from physiographic, topographic, and climatic features. Characterization of the mapping units consists of listing the two or three major and minor soil types commonly found there.

The scale of the soil maps is very broad, and the soils within the delineation are more varied and complex than the maps would indicate. Therefore, site-specific interpretations on the scale at which

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surface disturbance commonly occurs are not feasible or accurate. This type of map can be used for broad regional applications or when no detailed soil surveys exist.

Published Order III soil maps are available for southern Johnson County. Field mapping for Sheridan County is scheduled to be completed in 1986. Unpublished partial soil surveys for other counties are available from SCS field offices in Gillette and Buffalo. Order III soil survey is at a map scale of 1:24,000. It is useful for resource area data, watershed management, and range and soil rating potential.

The Gardner Mountain and North Fork WSAs contain predominantly loamy-textured soils on gently sloping to moderately steep terrain. Stony, shallow soils are found in many parts of the two WSAs, as are fertile timbered soils. Deeply incised major drainages contain steep escarpments of rock outcrop.

Fortification Creek WSA contains fertile soils on flat to gently sloping areas; soils with low permeability and high runoff on moderately sloping to steep areas; and recent alluvium in flat areas.

Soils in the WSAs are discussed in more detail in appendix 7.

Soil Management

The goal of the soil management program is to minimize sedimentation and deterioration of the soil resource base by preventing or reducing soil erosion.

Soil resources are evaluated case by case as part of activity planning and project planning. Such an evaluation considers the significance of the proposed project and the sensitivity of the soil resource in the affected area. Mitigating measures are attached as appropriate to ensure compatibility of projects with soil management.

The soils program in the past few years has consisted mainly of assistance to the range condition inventory by determining ecological site potentials for different soil types. This information is critical for determining range condition and relative soil productivity before AMP development.

The resource area has established erosion hazard classes of severe, critical, moderate, slight and stable according to a process described in *Erosion Condition Classification System* (USDI, BLM 1980d). The erosion hazard classes are used to determine potential problems that could occur as a result of surface development on soils with the various classes.

Topography

Topography in the Buffalo Resource Area varies from rolling hills and flat valley bottoms to mountainous terrain, steep canyons, and cliffs. Slopes on the face of the Big Horns range to more than 25% and contain prominent cliffs, rock outcrops, and large canyons such as those of the North Fork and Middle Fork of the Powder River.

The foothills area of the Big Horn Mountains range is characterized by rolling hills and prominent ridgelines. Slopes range from less than 10% to more than 25%, and elevation ranges from 4,800 feet to 5,800 feet.

Pumpkin Buttes are five major flat buttes that rise 600 to 1,000 feet above the surrounding landscape in southwestern Campbell County. North Butte reaches a high point of 6,049 feet. Slopes on the buttes generally range from 20% to more than 33%.

Much of the basin is composed of low rolling hills and flat valley bottoms. Slopes generally range from less than 5% to 10%, with a few isolated slopes of more than 25%. The rest of the basin is made up of rough areas called breaks. The Powder River Breaks near the center of the basin are the most noted. These are formed on flat interbedded sandstones and shales. Slopes are steep, most ranging from 15% to more than 25%. Hillsides appear terraced, and hilltops are at uniform elevations.

VEGETATION RESOURCES

Vegetation Communities

The vegetation of the Buffalo Resource Area varies from the sagebrush and grassland-dominated plains to the heavily timbered slopes of the Big Horn Mountains. The dominant vegetation types, in terms of total acres of occurrence, are the sagebrush and grassland types, which occur on approximately 59% of the lands inventoried in the resource area by the Missouri River Basin surveys. On the ridges and rougher areas of the Powder River Breaks, the mixture of sagebrush and grassland is broken by timber (juniper and pine) in patches of varying density and extent. Table 3-22 shows the vegetation types in the Buffalo Resource Area.

Vegetation communities vary depending upon soil types, precipitation, elevation, and temperatures. The resource area can be divided into four

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TABLE 3-22
VEGETATION TYPES
IN THE BUFFALO RESOURCE AREA

Type	Acreage	Percentage
Sagebrush	2,273,530	31
Grassland	2,050,521	28
Cropland	302,791	4
Conifer	125,539	2
Waste	91,273	1
Dense timber	73,335	1
Broadleaf trees	20,754	*
Saltbush	9,560	*
Greasewood	4,939	*
Meadow	1,250	*
Unclassified ¹	2,349,382	32
Total	7,318,880	100

*These vegetation types combined total 1%.

¹Unclassified areas include all lands in the resource area which lie within the boundaries of the Bighorn National Forest, the Thunder Basin National Grassland, and the Tongue River Basin portion of Sheridan County.

precipitation/vegetation zones that correlate generally with elevation and precipitation. The changes in elevation and precipitation are gradual; therefore, transition zones can be extensive in some areas.

Approximately 54% of the resource area lies in the 10-14 inch Northern Plains precipitation/vegetation zone. This zone includes most of the land in eastern Johnson and Sheridan counties and the southern half of Campbell County. The dominant vegetation types in the 10-14 inch Northern Plains zone are sagebrush, grassland, and cropland.

The 15-17 inch Northern Plains precipitation/vegetation zone occurs in northern Campbell County and represents about 19% of the resource area. The principal vegetation types in this zone are sagebrush, grassland, and conifer. The conifer vegetation type is restricted primarily to the northern portion of Campbell County.

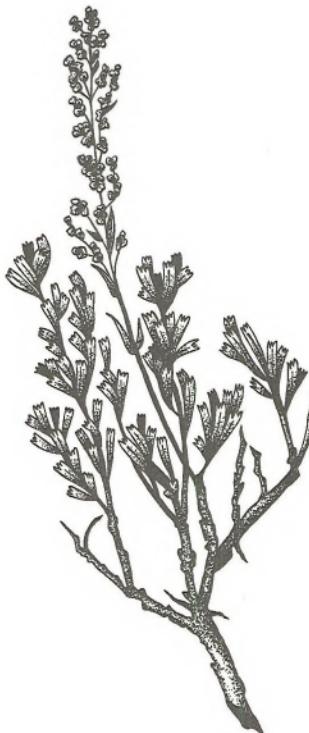
The 15-19 inch Foothills and Mountains East precipitation/vegetation zone is located along the east face of the Big Horn Mountains and in central Sheridan County. The principal vegetation types in this zone are dense timber, grasslands, croplands, mountain shrub, and sagebrush.

Approximately 12% of the resource area lies in the 15-19 inch Foothills and Mountains East vegetation/precipitation zone.

The 20 inches or more High Mountain precipitation/vegetation zone is in approximately 15% of the resource area. This zone is located on the west side of the resource area in the Big Horn Mountains, at elevations of more than 8,000 feet. The dominant vegetation types in this zone are dense timber, conifer, and grassland.

Vegetation types found in the different precipitation zones are listed in table 3-23. Vegetation distribution is indicated on map 13.

No threatened or endangered plants are known to exist in the resource area.



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TABLE 3-23
VEGETATION TYPES BY PRECIPITATION ZONE
IN THE BUFFALO RESOURCE AREA

Precipitation/ Vegetation Zone	Percentage of Resource Area	Principal Vegetation Types	Major Species
10-14 inch Northern Plains	54	Sagebrush, grass- land, cropland	Big sagebrush, bluestem wheat- grass, blue grama, dryland sedges
15-17 inch Northern Plains	19	Sagebrush, grass- land, conifer	Big sagebrush, bluestem wheatgrasses, needlegrass, ponderosa pine, juniper
15-19 inch Foothills and Mountains East	12	Dense timber, grass- land, mountain shrub, sagebrush, cropland	lodgepole pine Douglas-fir, ponderosa pine, spruce, Idaho fescue, June- grass, curlyleaf mountain maho- gony, big sage- brush
20 inches or more Mountains	15	Dense timber, coni- fer, grassland	Douglas-fir, lodgepole pine, subalpine fir, spruce, Idaho fescue, blue- grass, sedges

Forest Vegetation

The forest vegetation of the resource area varies from the subalpine fir, Englemann spruce, lodgepole pine, Douglas-fir, ponderosa pine, limber pine, and aspen forests of the Big Horn Mountains in the western part of the resource area to the scattered ponderosa pine, juniper, and cottonwood woodlands of the lower central and eastern parts of the resource area.

The forest vegetation of the Big Horn Mountains can be described in terms of six forest climax series: subalpine fir, Englemann spruce, lodgepole pine, Douglas-fir, ponderosa pine, and limber pine.

Subalpine fir climax forests are generally found on north-facing, moist, highly productive sites. They contain a seral component of Douglas-fir, Englemann spruce, lodgepole pine, and limber pine. Common understory plants are heartleaf arnica, sweet-scented bedstraw, Oregon grape, common juniper, and elk sedge.

Englemann spruce climax forests are generally on sites that range from moderately dry to moist, with above average forest productivity levels. The Englemann spruce forests are dominated by a seral lodgepole pine component, with the ecological advancement to the climax spruce stage occurring rather slowly on all but the more moist sites. Very few understory plants grow on these sites.

The lodgepole pine climax forests appear to be due to the absence of a suitable seed source from other climax tree species. Forest productivity on most of these sites is moderate. Common understory plants include grouse whortleberry, heartleaf arnica, common juniper, and elk sedge.

The Douglas-fir climax forests are primarily on north and northeast facing slopes between 7,200 and 8,200 feet. These sites are moderately productive and have a seral component of either ponderosa pine, lodgepole pine, or limber pine. Common understory plants include common juniper, heartleaf arnica, snowberry, white spirea, Oregon grape, and elk sedge.

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The ponderosa pine climax forests are primarily on east and south facing slopes between 5,500 and 7,300 feet. Productivity ranges from low to moderate. The seral forest component varies from almost pure ponderosa pine to a mixture of ponderosa pine and limber pine. Common understory plants include arrowleaf, balsamroot, Idaho fescue, and bluebunch wheatgrass.

The forests that climax out to limber pine are on the drier sites with shallow soils. They are the lowest in productivity and are generally considered noncommercial. Perennial grasses such as Idaho fescue and bluebunch wheatgrass are common understory plants.



In general, the forest vegetation of the Big Horn Mountains averages approximately 200 years in age and is at or approaching the climax stage of ecological development. Average potential yield capability for these forestlands is around 30 cubic feet per acre per year.

The forest vegetation in the lower elevational areas outside of the Big Horn Mountains is in scattered patches along major river drainages and on the ridgetops and side slopes of the rolling hills, escarpments, and buttes. Cottonwood is the primary vegetation along the major river and creek drainages in the resource area. Boxelder, green ash, and bur oak appear occasionally along some of the moister parts of the drainages.

Forest vegetation of ponderosa pine and Rocky Mountain Juniper is common on the dry rolling hills, escarpments, and buttes. These sites are generally extremely dry with rather low productivity. Perennial grasses are the common understory plants on these forest sites. Map 13 illustrates forest and woodland types for most of the resource area.

Vegetation in WSAs

The North Fork and Gardner Mountain WSAs are in the Douglas-fir Forest ecosystem, Rocky Mountain Forest province. The most widespread vegetation type is a big sagebrush-dominated shrub community with an understory dominated by grasses. The rest of the vegetation in these WSAs is an open forest/shrub/grassland type.

Fortification Creek WSA contains vegetation communities typical of the Powder River Breaks country. The most prominent is a sagebrush/grassland complex.

Appendix 7 contains more detailed information on vegetation in the WSAs.

VISUAL RESOURCES

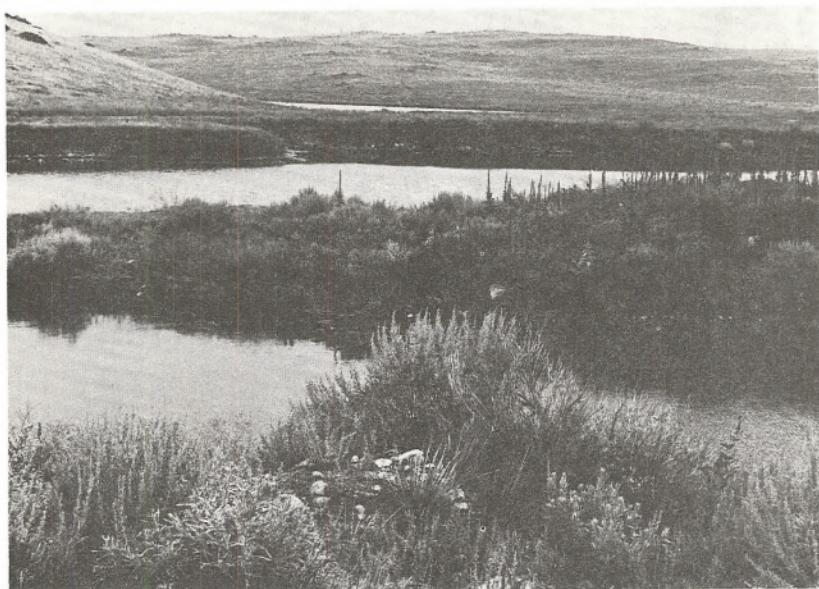
Resource Area Visual Resources

The characteristic natural landscape in the Buffalo Resource Area varies from forested mountains to rolling plains. There also are areas of altered landscape, such as oil fields, coal mines, and urban areas.

VRM classes have been identified for the resource area according to the BLM's visual resource inventory and evaluation system (see Glossary). These classes are delineated on map 3.

Visual sensitivity levels are determined by people's concern for what they see. Usually the highest sensitivity areas lie near communities,

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recreation areas, and heavily traveled highways. There are three visual zones: foreground-middleground (0 to 5 miles from a travel route or observation point), background (from 5 miles to a maximum of 15 miles from an observation point), and seldom seen (along infrequently used roads or beyond 15 miles from an observation point).

Scenic quality classes are defined by a system rating seven key factors: landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modification. Scenic quality classes A, B, and C are defined in the Glossary.

Management classes determine the amount of modification allowed to the basic elements of the landscape. Management classes I, II, III, IV, and V are defined in the Glossary.

The predominant VRM classes in the resource area are III and IV. However, several scenic areas have been rated Class II: the Middle Fork of the Powder River, the Red Wall in southwest Johnson County, the Bighorn National Forest, the foothills of the Big Horn Mountains, and the Gardner

Mountain and North Fork WSAs. (The Fortification Creek is rated Class III.)

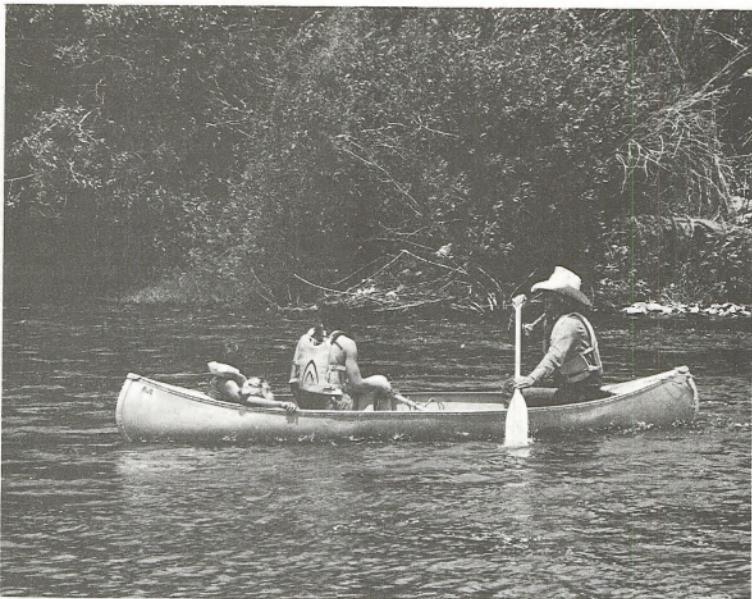
Visual Resource Management

The VRM objectives are to manage the quality of the visual resources and to reduce the effects of development on visual quality without reducing the effectiveness of other programs.

Visual resources will continue to be evaluated as a part of activity and project planning. Such evaluation will consider the significance of the proposed project and the visual sensitivity of the affected area.

Contrast ratings will be used in all plans and EAs when there is a potential for significant or controversial visual impacts or when the activity is in an important visual area such as one with a VRM Class II rating. Mitigating measures will be attached as appropriate to assure compatibility of projects with management objectives for visual resources.

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Courtesy of Wyoming Game and Fish Department

WATER RESOURCES

Surface Water

A surface water monitoring network in the resource area facilitates collection of baseline data on surface water quantity and quality, and it will make possible the quantification of the impacts of land management practices on the water resource.

The BLM has operated 12 monitoring stations on nine streams in the South Big Horns since 1980. Discharge, water chemistry, suspended sediment, and bacteriology have been monitored. Samples are taken periodically at nine additional locations in the Gardner Mountain and North Fork WSAs and in the Middle Fork Management Unit. In addition, the Geological Survey, U.S. Department of the Interior (GS), operates 10 gaging stations in the South Big Horns.

The BLM established nine monitoring stations in the Powder River Breaks in 1982. The same parameters are measured as at stations in the South Big Horns.

The northern and central portions of the Buffalo Resource Area are drained by the Powder River (which drains more than 65% of the area). The resource area is drained on the west by the Little Big Horn and Tongue rivers (14% of the area) and on the east by the Belle Fourche (11%), the Cheyenne (6%), the Little Powder (3%), and the Little Missouri (1%). All of these rivers are tributaries of the Missouri River system and have many perennial tributaries. Most perennial streams in the resource area head in the Big Horn Mountains to the west.

Precipitation ranges from about 12 inches per year at the lower elevations of Johnson and Campbell counties to more than 25 inches per year in the Big Horn Mountains of western Johnson and Sheridan counties. About half the annual precipitation falls in April, May, and June.

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Most streams have peak flows in June, during the period of maximum rainfall and snowmelt. Smaller streams are generally ephemeral or intermittent. The low-flow period is October through January.

The southern Big Horns area contains about 50 miles of perennial streams on public land. These streams and associated habitats represent an important fish and wildlife habitat type on both public and private land. Intermittent streams that flow long enough to support growth of riparian vegetation also provide important wildlife habitat.

Approximately 5% (4 miles) of the riparian habitat examined on BLM-administered public land in the southern Big Horns is in poor condition or declining in stability and habitat values for both fish and wildlife. According to existing inventories, 90% of the stable streams are in fair to good condition, essentially because topography and natural barriers keep livestock grazing at a minimum. The remaining 5% of the streams in the southern Big Horns were not inventoried but are believed to be in good condition.

Water quality in the southern Big Horns is generally good. In four years of BLM observation, the North Fork of the Powder River above Dull Knife Reservoir has had mean total concentrations of dissolved solids (TDS) of 58 milligrams per liter (mg/l) and a suspended solids (SS) concentration of 21 mg/l. Other perennial streams in the area have similarly low concentrations of dissolved and suspended solids.

Surface water in the Powder River Breaks is generally high in dissolved solids, hard, and unsuitable for irrigation because of high sodium content. The Powder River at Arvada had a flow-weighted average dissolved solids concentration of 2,055 mg/l in water year 1981. High suspended sediment concentrations are indicative of extensive erosion in the area. The maximum recorded sediment concentration in the Powder River at the Wyoming-Montana state line in water year 1981 was 51,500 mg/l.

The Little Powder River is typical of surface water outside of the South Big Horns and Powder River Breaks, where public land is extremely scattered. TDS at the GS station near Weston averaged 739 mg/l and SS averaged 3,752 mg/l in water year 1981. Maximum TDS observed during the year was 3,310 mg/l, and maximum SS observed was 6,710 mg/l. The major cations are calcium, magnesium, and sodium. The principal anion is sulfate.

The principal drainages in the Gardner Mountain WSA are the North Fork of the Red Fork of the Powder River, a perennial stream, and Beartrap Creek, which is also perennial. The principal drainages in the North Fork WSA are Pass Creek and the North Fork of the Powder River, both perennial. Fortification Creek WSA is drained by Fortification Creek, Bull Creek and Deer Creek, all ephemeral streams.

Groundwater

Groundwater in the Buffalo Resource Area is used for a variety of purposes, including domestic, municipal, industrial, and agricultural uses. Domestic and livestock wells are usually low yield (1 to 25 gallons per minute [gpm]), intermittent producers. Water for domestic and livestock use is generally found at depths less than 1,000 feet and occasionally in flowing springs. Industrial water wells are used primarily for secondary recovery of petroleum.

Aquifer-containing formations in the Buffalo Resource Area have a total thickness of more than 9,000 feet. The shallowest aquifers are contained in quaternary alluvial deposits that vary in thickness from a few inches to 50 feet. Most alluvium is too fine-grained to yield much water; however, clean coarse-grained material along rivers may yield up to several hundred gpm. Recharge to alluvial aquifers is from precipitation, runoff, and upward seepage from underlying formations. Discharge results from evaporation, seepage into streams, pumpage, or groundwater flow into deeper formations.

The water quality of alluvial aquifers is highly variable throughout the resource area. Quality in the Tongue River drainage is generally good, although the water is very hard. Much of the alluvial groundwater in the Powder River floodplain is highly mineralized, very hard, and below acceptable standards for domestic use and irrigation (Wyo. St. Eng. Ofc. 1972).

Alluvial groundwater in the Belle Fourche drainage is very hard, contains relatively high iron concentrations, and is moderately to highly mineralized. The chemistry of the water varies greatly; it is strongly influenced by the underlying lithology (Wyo. St. Eng. Ofc. 1972).

Alluvial groundwater in the Cheyenne River drainage of southern Campbell County is usable for domestic, stock, and irrigation use, but

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domestic use may be restricted locally because of high dissolved solids concentrations, high iron content, and high sulfate content. Irrigated lands require good soil drainage in order to filter the sodium and salinity hazard (Wyo. St. Eng. Ofc. 1972).

Below the quaternary alluvium, groundwater is available in the Tertiary Wasatch and Fort Union formations and in the Upper Cretaceous Lance Formation and Foxhills Sandstone-Hell Creek group. Water in these bedrock aquifers is available at relatively shallow depths in sufficient quantity for domestic and livestock use.

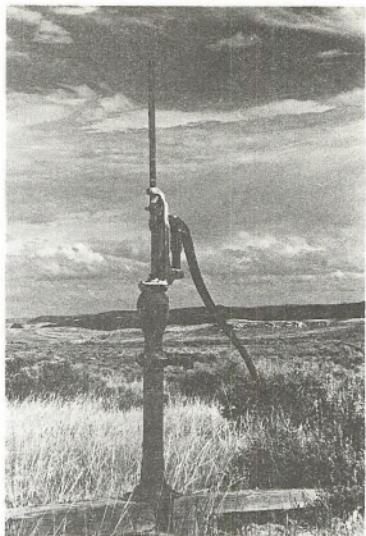
Larger yields and better quality water are usually available in the lower parts of the shallow bedrock aquifers. Domestic and livestock wells are commonly less than 1,000 feet deep and yield about 25 gpm. Industrial and municipal wells are deep—often 3,000 to 5,000 feet—and open to several formations. These deeper wells can yield more than 100 gpm (USDI, BLM 1981b).

The Fort Union Formation contains the most extensively used aquifer in the area (USDI, BLM 1981b). Groundwater from the Fort Union is obtained from relatively small lenticular sandstone beds and from more extensive coal beds. Clinker zones in the Fort Union are very permeable; however, they are frequently above the water table (USDI, GS 1974).

Recharge to the shallow bedrock aquifer system occurs mainly in upland areas through sandy zones of the Fort Union Formation, coarse-grained alluvium, and clinker. Perched zones are common because of the distribution of impermeable shale layers in the water bearing formations (USDI, BLM and Woodward-Clyde 1981).

The chemical quality of the water from shallow bedrock aquifers is highly variable. Dissolved solids range from about 150 to about 3,000 mg/l. The best quality water, generally less than 500 mg/l dissolved solids, is obtained from clinker beds. The poorest quality water is generally obtained from shallow aquifers in the Wasatch Formation. Water from coal beds generally contains 1,000 to 2,000 mg/l dissolved solids (USDI, GS 1974). As depth to the aquifer increases, water quality tends to improve, with a transition from a hard calcium-magnesium-sulfate type to a softer sodium bicarbonate type (USDI, BLM 1981b).

The shallow bedrock aquifers are underlain by a sequence of Cretaceous shales up to 5,500 feet thick. The shales, which have very low hydraulic conductivity, separate the water-bearing units from the Madison aquifer system.



The deepest aquifers in the resource area are in the Madison aquifer system. The water bearing units are composed entirely of carbonates with well-developed fracture and solution zones. Yields of more than 1,000 gpm are available where caverns and fractures are present; where they are absent, yields are much lower.

Most of the recharge to the Madison aquifer system is through outcrop areas in the Black Hills and the Big Horn Mountains. The water in this aquifer becomes progressively more mineralized with increasing distance from the recharge areas. Discharge is from springs, wells, and seepage into stream valleys. Water from the Madison aquifer system is used by the city of Gillette as well as by municipalities outside the Buffalo Resource Area.

Water Management

The goal of the water management program is to comply with relevant laws and policies for protecting and enhancing the quality, quantity, and use of waters on public lands.

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Water quality will be maintained or improved in accordance with state and federal standards. The program includes consultation with state and private entities on proposed projects that may significantly affect water quality.

A data base of water quality and quantity information is being assembled through use of existing data and collection of supplementary data. This will be useful in identification of problem areas and for monitoring impacts of management actions.

The resource area will continue to monitor intensive management activities such as timber harvesting with potential for significant impacts to water resources.

WILDERNESS

Wilderness Study Areas

Through the BLM's intensive wilderness inventory process, three areas in the Buffalo Resource Area were identified in 1979 and 1980 as having wilderness characteristics. These areas, now the Gardner Mountain, North Fork, and Fortification Creek WSAs are described in detail in appendix 7. Table AP7-7 in that appendix details the wilderness characteristics of each of these WSAs. The inventory narratives for the three WSAs are on file at the Buffalo Resource Area office.

The Gardner Mountain WSA (6,423 acres) and the North Fork WSA (10,089 acres) are in the south Big Horn Mountains. The Fortification Creek WSA (12,419 acres) is in the northern Powder River Breaks area. Appendix 7 contains detailed descriptions of the WSAs.

Management of Wilderness Study Areas

The goals of the wilderness program are to complete the wilderness review process in the wilderness study areas; to maintain the areas without impairment of the wilderness values until Congress acts on the recommendation for designation or nondesignation; to manage areas that might be designated wilderness according to the 1964 Wilderness Act; and to return to multiple use any areas not designated wilderness.

Management of the wilderness study areas according to the BLM's interim management policy will continue until the WSAs are reviewed

and acted upon by Congress. In accordance with the interim management policy, the WSAs will be managed to prevent unnecessary and undue degradation of the land, and when it does not conflict with valid existing rights, they will be managed to meet the nonimpairment standard as well.

If Congress should add any of these WSAs to the National Wilderness Preservation System, these areas will be managed in compliance with the BLM's wilderness management policy. Site-specific wilderness management plans will be developed for such areas.

Areas reviewed by Congress but not added to the National Wilderness Preservation System will be managed in accordance with other applicable guidance provided by this resource management plan.

WILDLIFE RESOURCES

Wildlife in the Resource Area

Fisheries

The Buffalo Resource Area contains both cold-water and warmwater fisheries. Warmwater fishes (largemouth bass, rock bass, black bullhead, and channel catfish) are restricted to reservoirs and the Powder River. Coldwater fishes (rainbow, brown, brook, and cutthroat trout) are found in streams in the south Big Horns and in several livestock reservoirs.

All 50 miles of perennial streams on public land in the south Big Horns contain one or more species of trout. Nongame fishes are restricted to the middle and lower reaches of the streams. Fish habitat is in poor condition on 1 mile of streams and fair condition on 10 miles of streams. The rest is in good condition.

The Wyoming Game and Fish Department has identified three fish species of high state interest that occur in the Powder River drainage—the shovelnose sturgeon, the goldeye, and the sturgeon chub.

The shovelnose sturgeon is found in the Powder River near Arvada and in Crazy Woman Creek. It no longer occurs in the North Platte and Big Horn rivers, where it was documented before 1900.

Goldeye are found throughout the Missouri River drainage and historically in the North Platte, Big Horn, Powder, and Little Missouri drainages. However, their range in the Rocky Mountain

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states is now limited to the lower Powder River, the Little Missouri River, Crazy Woman Creek, and lower Clear Creek.

The sturgeon chub is fairly abundant in the Powder River; however, its range is limited.

Table 3-24 shows fisheries habitat, land statistics, and population data for streams in the south Big Horns. Approximately 95% of the riparian and wetland habitat in the resource area is on private or state land.

Riparian Habitat

Riparian areas provide excellent wildlife habitat for a variety of species. A few wetland areas near small stock ponds are in poor condition as a result of heavy livestock use. Riparian zones along drainages in the Powder River Breaks are generally in poor condition, which is characterized by bank sloughing, increased downstream siltation, poor streamside herbaceous vegetation, and lack of young woody vegetation. Most of the streams in the breaks are not on public land.

TABLE 3-24
FISH HABITAT AND POPULATION DATA FOR STREAMS
IN THE BUFFALO RESOURCE AREA

Location	Miles BLM	Miles State	Miles Pvt.	Total Miles	Major Species ^a	Average Population Status on BLM
Buffalo Creek	3.5	1.0	7.0	11.5	BT	2,520 trout/mi 365 lb/ac
Middle Fork Powder River	9.0	3.0	5.0	17.0	RT, BT BrT, LD	5,220 trout/mi 297 lb/ac
Blue Creek	1.5	0.5	6.0	8.0	BrT, RT, BT, LD, NS	561 trout/mi
Beaver Creek	5.5	0	3.0	8.5	BT, RT, WS, LS, MS, LD, FHC	1,315 trout/mi 194 lb/ac
Red Fork Powder River	2.0	1.0	7.0	10.0	RT, BT, BrT, MS, LD, WS,	520 trout/mi 47 lb/ac
North Fork Red Fork	4.0	0	2.5	6.5	RT, BrT, MS, LD	865 trout/mi 89 lb/ac
Beartrap Creek	3.0	2.0	5.5	10.5	RT, BrT	1,162 trout/mi
Pass Creek	3.0	0.5	5.0	8.5	RT, BT	
North Fork Powder River	9.0	2.5	15.0	26.5	RT, BT	1,813 trout/mi 320 lb/ac
Middle Fork Crazy Woman	1.5	1.0	13.5	16.0	RT, BT, BrT	2,860 trout/mi 270 lb/ac
Poison Creek	2.5	0	3.0	5.5	RT, BrT, BT	1,330 trout/mi 135 lb/ac
South Fork Red Fork	4.5	0	4.5	9.0	RT, BT, BrT	1,503 trout/mi 86 lb/ac
Beaver Creek f2	1.0	0.5	4.0	5.5	BT	

SOURCE: Wyoming Game and Fish Department, 1983

a. Legend for Major Species

- RT - Rainbow Trout (*Salmo gairdneri*)
- BT - Brown Trout (*Salmo trutta*)
- BrT - Brook Trout (*Salvelinus fontinalis*)
- CT - Cutthroat Trout (*Salmo clarki*)
- MS - Mountain Sucker (*Catostomus platyrhynchus*)
- LD - Longnose Dace (*Rhinichthys cataractae*)
- WS - White Sucker (*Catostomus commersoni*)
- LS - Longnose Sucker (*Catostomus catostomus*)
- FHC - Flathead Chub (*Hyphessobrycon gracilis*)

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Big Game

Deer

Mule deer are found throughout the resource area—the total number is estimated at 67,000. The better mule deer habitats are in south Big Horns, the Powder River Breaks north of I-90, the timbered breaks along the Little Powder River, and the forested scoria hills in northern Campbell County and Sheridan County.

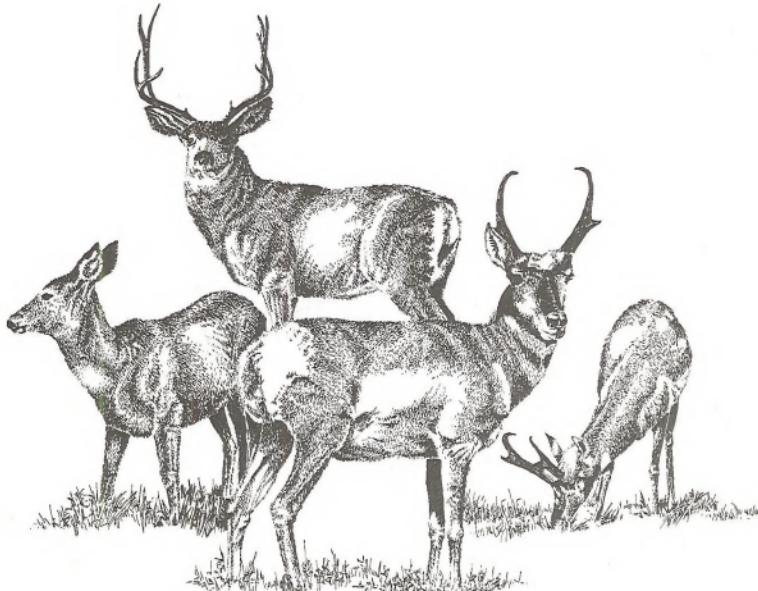
Mule deer are the most abundant big game animal in the south Big Horns. The post-hunt season population on BLM land in this area is 6,600. The goal of the Wyoming Game and Fish Department for the herd units in this area is to maintain the existing numbers.

Mule deer winter on the foothills and broken slopes in the south Big Horns and congregate on agricultural land during late summer and fall. Deer rely on shrub and forb species for much of their diet. Competition with livestock occurs mainly in spring and summer, when diets overlap. For

example, the Worland District of the BLM reports that the estimated dietary overlap between deer and domestic sheep (on a year-round average) is 53%; between deer and cattle it is 15% (USDI, BLM 1982d). These percentages probably would be similar in the Buffalo Resource Area.

The post-season mule deer population on BLM-managed land in the Powder River Breaks is estimated at 4,500. Population and productivity are below capacity, with local exceptions such as Fortification Creek area. The Wyoming Game and Fish Department goal is to increase mule deer numbers in this area to 6,500. Mule deer use the riparian zones along the Powder River and associated drainages in summer and fall, but in the winter they are found scattered throughout the breaks where browse and thermal cover are present. Water is a limiting factor for mule deer distribution in both the south Big Horns and the Powder River Breaks (see map 14).

White-tailed deer, which are restricted to the major drainages that support woody riparian habitat, number about 13,000 in the resource area.



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Antelope

Antelope are found throughout the resource area. The Wyoming Game and Fish Department estimated the antelope population in the resource area at 42,000 before the 1980 hunting season.

The estimated yearlong antelope population on BLM-managed land in the south Big Horns is 325. The Wyoming Game and Fish Department goal for most of the area is to maintain the existing numbers. Although localized migration occurs during normal winters, the only significant antelope movement is along the North Fork of the Powder River, where populations move from the higher elevations in the summer to lower elevations during the winter.

The estimated yearlong antelope population in the Powder River Breaks on BLM-managed land is 3,100. The Wyoming Game and Fish Department's goal, except for localized areas, is to maintain the existing numbers. Although localized migration occurs during normal winters, antelope have been known to cross the Powder River during severe winters and travel several miles in search of suitable cover and forage.

Antelope are restricted to flat or rolling topography and are seldom found in rough "breaks" habitat on both sides of the Powder River. Water does not seem to be a limiting factor on antelope numbers, but populations are limited by the availability of preferred habitat.

Elk

Elk are common year-round in the south Big Horns. There are small populations in the Fortification Creek and Rochelle Hills areas.

Elk in the south Big Horns number about 1,650; winter populations fluctuate between 655 and 1,450. Elk migrate from higher elevations in the Bighorn National Forest and the Beartrap area to the crucial winter ranges along the North Fork of the Powder River, Beaver Creek, and the Middle Fork of the Powder River. Little is known about the migration patterns near the Middle Fork of the Powder River and Beaver Creek, where elk numbers have decreased in recent years.

Elk range in the south Big Horns varies from drainage to drainage and seasonally. From the Billy Creek area to the Horn, elk are scattered in small groups in heavy timber areas adjacent to open parks. Areas near Bald Hill and along the North Fork of the Powder River, Pass Creek, and Mayoworth Slope are crucial winter ranges for

elk. Elk also winter south of the Red Fork of Powder River, near the head of Beaver Creek, and along the Middle Fork of the Powder River on the Ed. O. Taylor game range (see map 14).

Because of the scattered land pattern in the North Fork elk unit, populations and harvest depend largely on access controlled by private landowners.

Elk winter populations and harvest in the Middle Fork area have decreased significantly in the past five years, possibly because of herd movement in response to heavy recreational use and lack of hiding cover. Approximately 90% of the elk winter on the Ed. O. Taylor big game range or on adjacent public land.

The Middle Fork management unit contains the Ed. O. Taylor game range. Livestock grazing on the game range is restricted, so forage conditions for big game are good to excellent. The game range and surrounding area are crucial winter range for elk and important winter and yearlong range for deer. Forage availability in that area appears to be improving from fair to good.

Approximately 250 elk inhabit the Fortification Creek area in the Powder River Breaks. Elk historically occupied the area, but low numbers were supplemented by transplants in the early 1950s and in 1974. The goal of the Wyoming Game and Fish Department is to increase the herd size to 300 head and allow for a limited quota hunting season.

Elk range in the Fortification Creek area is in good to excellent condition; however, water is a limiting factor during the summer in the Bull Creek and Snell Creek Canyon areas. Because of water limitations and the intensive oil and gas development in the Fortification Creek area, elk have scattered from traditional seasonal use areas. There is little competition for forage between livestock and elk in this area. However, the present elk and mule deer populations are threatened by the impacts associated with oil and gas development and increased access.

Bighorn Sheep

Bighorn sheep were reintroduced in the mid-1970s on the Ed. O. Taylor game range in Johnson County. The survival of Bighorn sheep in this area is questionable because lungworm, pneumonia, poaching, and predation have decimated the population. It is estimated that only three animals remain.

Affected Environment

Table 3-25 indicates big game populations and forage requirements.

Mountain Lions

Mountain lions are found in the rough, broken canyon country in the south Big Horns. It is estimated that 15 to 25 lions inhabit the south Big Horns; WGFD personnel estimate the total in the entire resource area is about 50. Livestock depre-

dation losses from mountain lions have increased in recent years. This could be attributed to higher populations.

Black Bear

The south Big Horns area is inhabited by 10 to 30 black bears. Their preferred habitat is dense timber stands near the North Fork, Billy Creek, and Gardner Mountain areas.

TABLE 3-25
BUFFALO RESOURCE AREA
BIG GAME POPULATIONS
AND AUM REQUIREMENTS

Species	Herd Unit	WGFD Objective for Post Hunt Population ^a	Estimated % BLM	Adjusted BLM Population	Animal Units ^b	AUMS ^c
Mule Deer	Powder River (17, 18, 23, 26)	36,000	15	5,400	64,800	8,308
	Pumpkin Buttes (19, 20, 29, 31)	14,000	20	2,200	26,400	3,385
	Upper Powder River	14,000	40	5,600	67,200	8,615
Antelope	Clearmont (15)	2,800	8	224	2,688	249
	Ucross (16)	2,500	30	750	9,000	833
	Gillette (17)	11,000	5	550	6,600	611
	Upper Powder River (20)	2,300	5	115	1,380	128
	Middle Fork (21)	2,150	40	860	10,320	955
	Crazy Woman (22)	3,500	20	700	8,400	778
	Pumpkin Buttes (23)	10,000	12	1,200	14,400	1,333
Elk	Highlight (24,101)	10,000	7	700	8,400	778
	Fortification (2)	150	80	120	1,440	686
	SE Bighorn (33)	300	60	180	2,160	1,029
	(34)	900	25	225	2,700	1,286
Total AUMS						28,974

a. From Wyoming Game and Fish 1982 Completion Reports.

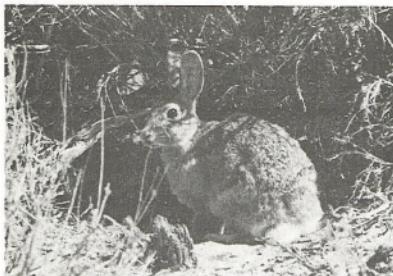
b. Animal Units = BLM population number x 12 months.

c. AUMS conversion = 10.8 Antelope per AUM.

7.8 Deer per AUM.

2.1 Elk per AUM.

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Small Game

Some small game species found in the Buffalo Resource Area are cottontail rabbits, red squirrels, sage grouse, sharp-tailed grouse, blue grouse, Merriam's turkey, chukar partridge, Hungarian partridge, ring-necked pheasants, and mourning doves.

Sage grouse, blue grouse, ruffed grouse, and chukars are common in the south Big Horns, where there is suitable habitat. Blue and ruffed grouse are found in the forested areas; chukars and sage grouse usually are at lower elevations.

Sage grouse and sharp-tailed grouse are found throughout the resource area; however, their populations have declined slightly in the past decade. The primary cause of the decline is thought to be habitat loss associated with sagebrush eradication programs and extensive energy development.

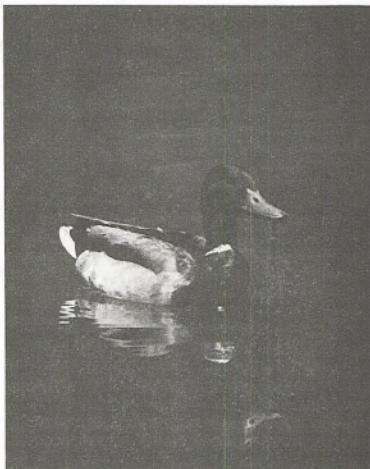
There are more than 50 sage grouse strutting grounds in the resource area. Grouse in the resource area are of high state and federal interest because of their recreational value for hunting and observation.

Scattered populations of wild turkeys are found throughout the resource area along major drainages and in ponderosa pine habitat.

Waterfowl

The many livestock ponds and streams in the resource area provide a substantial amount of nesting habitat for waterfowl, especially mallards, gadwalls, and blue-winged teal. Small stock ponds also are significant for waterfowl breeding.

Canvasback ducks, a species of high federal interest, appear in the resource area primarily during the fall and spring migration.



Courtesy of Wyoming Game and Fish Department

Nongame Birds

Nongame bird species of high federal interest are sandhill crane, white pelican, double-crested cormorant, long-billed curlew, mountain plover, dickcissel, and Lewis woodpeckers. These species are mostly migratory; however, mountain plover, Lewis woodpecker, cormorants, and long-billed curlews have been known to nest here.

Raptors

Many raptor species are common in the resource area. Common nesters include golden eagles, red-tailed hawks, falcons, great horned owls, kestrels, and ferruginous hawks.

Species of high federal interest in the resource area are burrowing owl, osprey, merlin, ferruginous hawk, prairie falcon, and golden eagle. The most numerous are golden eagles; more than 300 nests are known. Prairie falcons and ferruginous hawks also are common nesters. Nesting of ospreys and merlins in the resource area is limited.

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Threatened and Endangered Species

An estimated 100 to 200 bald eagles winter in the resource area. They usually are found in all habitats, with roosts along drainages containing mature deciduous or coniferous trees. Two bald eagle nests on private land were discovered in Sheridan County in 1983. Data from annual counts of wintering bald eagles in the resource area indicate an upward trend in population.

Peregrine falcons may migrate through the resource area, but no nest sites are known.

No reports of black-footed ferrets in the resource area have been confirmed, but several unconfirmed sightings have been reported. Black-tailed prairie dog towns, which are potential ferret habitat, are found on approximately 2,000 acres of public land in the resource area.

There has been no official declaration of critical habitat for threatened or endangered species in the resource area.

Wildlife Habitat Management

Goals

The goal of wildlife habitat management is to ensure the quality and quantity of wildlife habitat necessary to support healthy, self-sustaining, diverse populations of native wildlife in the resource area.

The wildlife program objective in land use planning is to ensure that wildlife values are fully considered in allocations of land and other resources. Land use planning documents recognize wildlife values and provide for the protection and enhancement of wildlife habitat on the basis of wildlife problems, needs, and opportunities.

On a state and local level, the enhancement of wildlife habitat will be consistent with population goals and objectives set in the strategic plans of the WGFD.

Policies

Planning decisions concerning wildlife must include consideration of qualitative differences in the importance of wildlife habitat. These differences should be reflected when objectives are set and tradeoffs made in land use planning and operational management decisions.

BLM policy has established the following priority order for protection of wildlife: (1) protection of threatened and endangered (T&E) species and their crucial habitat, (2) protection of "priority" species and their habitat, and (3) protection of key habitat.

Protection of Threatened and Endangered Species

Priority will be given first to protection of T&E species and their critical habitat. Other uses will be allowed to the extent that they do not conflict with T&E species protection.

To accomplish T&E species objectives, the resource area processes T&E clearance on all activities, conducts inventories, monitors the resource area to determine occurrence and use of habitat, and consults with the WGFD and the USFWS before projects are implemented that could affect habitat for T&E species. If a BLM biological assessment indicates that a proposed action may affect a threatened or endangered species or its habitat, consultation with the USFWS will be initiated according to section 7 of the Endangered Species Act of 1973, as amended.

Protection of Priority Species

Consideration is given to protection of "priority" species and their habitats when land is allocated among resource uses and when constraints are



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applied on those uses to mitigate impacts and to benefit the wildlife resource. Priority species include those of high state and federal interest. Species now on the "priority" list are elk, mule deer, white-tailed deer, antelope, bighorn sheep, moose, mountain lion, black bear, sage grouse, sharp-tailed grouse, blue grouse, ruffed grouse, partridge, wild turkey, pheasant, migratory game birds, small game animals, game fish, and high interest migratory birds such as golden eagle, prairie falcon, osprey, merlin, and burrowing owl. The list is subject to change.

The primary means of protecting priority species is to identify public land of crucial importance to these species through inventories and monitoring, and to maintain or enhance their habitat. Habitat improvement will be accomplished through implementation of HMPs. The BLM's policy dictates that wildlife considerations will be incorporated into other resource activity plans for the protection of wildlife habitat.

Protection of Key Habitat

Riparian, aquatic, and wetland areas, which are of limited extent in the resource area, are crucial for maintaining wildlife diversity and abundance. These key habitats receive third priority in land

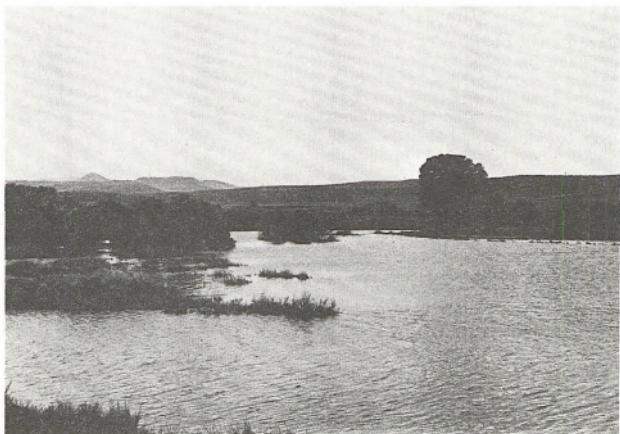
use allocation. Projects completed to date are fencing of two streams and closing of one road to protect riparian areas.

Planning and management of wildlife habitat are conducted on an ecosystem basis to the extent possible. Case-by-case evaluation of fish and wildlife habitat will continue as part of project planning. The evaluation will include consideration of the significance of the proposed project and the sensitivity of fish and wildlife habitat in the affected area. Mitigating measures will be attached as appropriate to ensure compatibility of projects with management objectives for fish and wildlife habitat.

Habitat improvement projects will be implemented where necessary to stabilize or improve unsatisfactory or declining wildlife habitat condition. Such projects will be identified through habitat management plans or coordinated resource management activity plans. Seasonal restrictions will be applied where necessary to mitigate the impacts of human activities on important seasonal wildlife habitat.

Animal Damage Control

The U.S. Fish and Wildlife Service will continue to conduct animal damage control as described in appendix 4.



SOCIOECONOMIC CONDITIONS

BASELINE SOCIAL CONDITIONS

Gillette and Campbell County are expected to be the locations of high population growth and social change from 1984 to 1995. Energy production, which is currently the keystone of the local economy, will be the source of the expansion. Both the city and county have been transformed during the past decade or so. The city is urbanized, with a diverse, largely short-term resident population.

The changes that Gillette and Campbell County have already undergone put them in a strong position to absorb future growth. The local regulatory, fiscal, service-facility, and administrative systems are sound. Social disruptions remain at fairly high levels, but a settling effect has taken place as growth and instability have paused because of current conditions of the national energy market.

Nevertheless, the area's population is projected to double by 1990. This rate is equivalent to the growth that occurred from 1970 to 1980. While it is unlikely that such growth would be accompanied by the disruptions and uncertainties of the past decade, this is still a very large number of people to be absorbed into the community structure. Gillette and Campbell County have high capacities to manage growth, but these capacities will be stressed during the next decade if the forecast growth occurs.

Sheridan and Sheridan County also have undergone significant change during the past ten years. In this area, however, the numbers of new persons living in the city and the surrounding area have been moderate, particularly in comparison to Gillette. Much of Sheridan's growth was fueled by coal development on the north side of the Montana-Wyoming state line. Sheridan thus received an influx of workers and secondary employment effects from these mines but has not been in a position to capture some of the tax benefits that fall to Montana and its counties. This remains an important issue in the area.

Even with these changes, the Sheridan area has never had severe growth management problems. Mining has long been an important part of the local economy, as have tourism, recreation, ranching, and farming. Sheridan remains a stable

city with no profound municipal or county problems in education, housing, health care, or law enforcement.

Sheridan and the area may grow substantially during the next decade. Like Gillette, Sheridan is in a strong position to manage this growth successfully. However, if several new mining ventures begin production during the next several years, Sheridan's capacity will be strained. This would be particularly evident if the mines are located on the Montana side of the border. This would be resented by many residents of the Sheridan area, where moderate growth is acceptable but rapid growth is less welcome.

Johnson County has been largely unaffected by population growth in nearby Sheridan and Campbell counties. The county and its main city, Buffalo, increased in population during the 1970s, but at a slow pace. The county remains greatly influenced by the traditional economic bases: tourism, ranching, and farming. There is a sizable number of retirees as well. Oil and gas production is evident in the southern part of the county, and oil and gas activities provide employment for a relatively large number of people in the county.

Buffalo and Johnson County are forecast to remain steady-state areas, with no dramatic changes in the local economy or population, during the next several years. Given the amenities of the area, this may be preferable to the majority of the residents. Many of these persons choose to live in Buffalo and Johnson County because of the relaxed atmosphere.

ECONOMICS

Sales, Employment, and Salaries and Wages

Table 3-26 presents sales for the Buffalo Resource Area in 1980 by county and industrial sector. Table 3-27 presents employment and salaries and wages for the Buffalo Resource Area in 1980 by county and industrial sector, with projections for 1985, 1990, and 1995.

The projections are based on the assumption that the industrial projects listed in appendix 8 either exist now or will exist in the timeframe

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TABLE 3-26
ESTIMATE OF SALES IN 1980 BY COUNTY AND SECTOR
IN THE BUFFALO RESOURCE AREA^a
(in millions of dollars, rounded to the nearest million)

County/Industry Group	Campbell County	Johnson County	Sheridan County
All mining	<u>1,431</u>	<u>159</u>	<u>103</u>
Coal mining ^b	453	—	96
Oil and gas ^b	977	134	7
Other mining ^b	—	25	—
Construction	183	19	88
Manufacturing	73	41	220
T.U.C. ^c	106	11	39
Wholesale trade	42	2	26
Retail trade	42	8	38
F.I.R.E. ^d	39	11	44
Agriculture	27	22	28
All other ^e	<u>164</u>	<u>26</u>	<u>.87</u>
Total sales	2,107	299	673

NOTE: Figures may not add due to rounding.

a. Derived from the Casper District input-output model.

b. Included in the "All Mining" category.

c. Transportation, utilities, and communications.

d. Finance, insurance, and real estate.

e. Includes state and local government and other services such as motels, hotels, restaurants, theaters, repair services, education, health, water, sewer, and trash.

considered, within the region of influence. It should be noted that several water projects under consideration for the area were not included because it was not felt that planning for the projects had progressed to a point that would allow timeframes and impacts to be analyzed.

Sales, employment, and salaries and wages in the Buffalo Resource Area are dominated by the mining industry. This dominance is illustrated by the fact that in 1980 sales by the mining industry accounted for more than 50% of the total sales in the resource area (see table 3-26).

Further evidence of the importance of the mining sector to the economy of the area can be found in the fact that mining employment, which accounted for about 21% of total area employment in 1980, earned about 34% of total salaries and wages paid in the area in 1980. Projections indicate that mining employment will grow to about 45% of the area employment by 1990 and earn about 62% of the salaries and wages paid in the area at that time.

The dominance of mining can be seen at the county level for Campbell and Johnson counties; however, it was not evident in Sheridan County in 1980, when sales in the manufacturing sector represented the largest part of total sales in the county and construction workers earned more than the employees of any other single sector in the county. The mining sector will become increasingly important to the Sheridan County economy, however, as mining employment will grow from about 5% of the total Sheridan County employment in 1980 to about 16% in 1990, and salaries and wages paid to the Sheridan County mining sector will grow from about 9% of all Sheridan County 1980 salaries and wages to about 29% in 1990.

Population and Housing

Table 3-28 presents 1980 population and housing for the Buffalo Resource Area, along with projected

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population and housing requirements for benchmark years. Increases in population and housing requirements can be expected to approximate the projected increase in employment for the area through 1995. This will be seen for Campbell and Johnson counties, but again Sheridan County will be the exception.

Projections of Sheridan County population for 1995 are about 157% of the 1980 Sheridan County population, but projections of Sheridan County employment for 1995 are only about 147% of 1980 Sheridan County employment. The reason is that the number of Sheridan County residents that are dependent upon employment in southern Montana will increase by a factor of 3. This effect will be even more pronounced in 1990, when temporary employment for the construction of projects in southern Montana will cause a peak in the number of persons residing in Sheridan County.

Local Expenditures, Community Services, and Recreation

Tables 3-29 and 3-30, and table 3-14 (in the "Recreation" section) present the local expenditure levels, community services, and outdoor recreation usage levels in 1979-1980 for the Buffalo Resource Area, with projected requirements for benchmark years. The projections are indexed to 1979-1980 levels of population in order to maintain the standards of that period.

Agricultural Economics

The economy of the Buffalo Resource Area has traditionally been considered a rural, agricultural economy that is oriented toward cattle production. However, the importance of agriculture to the area's economy has slipped over time to the point that sales by the agricultural sector were only 2.5% of total sales by all sectors in the area (see table 3-26). Nevertheless, the agricultural economy in the area continues to be dominated by cattle production. More than 80% of 1980 cash receipts for the sale of agricultural commodities in the area were from the sale of cattle and calves (see table 3-31).

Table 3-32 presents an estimate of the gross return for supporting an animal unit of cattle or sheep in inventory for one month in each county of the Buffalo Resource Area. The estimates are based on cash receipts for cattle and sheep

between 1975 and 1979. The gross returns to an animal unit in several wildlife classes also are presented. It should be noted that the returns to wildlife are based on hunter expenditures and therefore must be considered as returns to the economy of Wyoming, as the expenditures might have occurred in any county of the state. It also should be noted that the animal unit conversions used are footnoted on the table and may not be the same as conversions presented elsewhere in this document.

Tables 3-33, 3-34, and 3-35 present estimates of net returns to animal units in inventory for 75, 400, and 1,000 cow enterprises in each county of the resource area. The number of animal units estimated for each size of enterprise is based on the composition of the cattle inventory on January 1 in each county, between 1975 and 1979. It will be noted that the net returns were estimated by applying estimates of 1979 costs to the estimated five-year (1975-1979) average gross return. This is particularly realistic in light of the fact that cattle prices rise and fall in a cyclical manner, but operating expenses are on a constant upward trend.

Although the "net returns after all costs" depicted in tables 3-33, 3-34, and 3-35 are typical of the low returns to agriculture in general, it should not be concluded that all cattle operations are losing money and going bankrupt. The "other costs" depicted in this analysis (family labor, depreciation, and interest or return on land and other investment) can be considered "paper costs" and not "out-of-pocket" costs. They should serve to illustrate, however, that agriculture does not enjoy the same rate of return on investment that other industries take for granted.



TABLE 3-27
 PROJECTED TRENDS IN COVERED EMPLOYMENT AND SALARIES AND WAGES FOR BENCHMARK YEARS
 IN THE BUFFALO RESOURCE AREA
 (salaries and wages are in millions of dollars; columns may not add due to rounding)

County/Sector	1980 ^b		1985 ^c		1990 ^c		1995 ^c	
	Employment	Salaries and Wages						
Campbell County								
Coal mining ^d	2,022	54.3	6,200	166.4	14,500	389.3	16,500	443.0
Other mining ^d	2,106	56.5	2,170	58.3	2,800	75.2	3,200	85.9
Construction	2,331	49.4	880	18.7	2,130	45.2	1,230	26.1
Manufacturing	163	2.6	160	2.5	200	3.1	200	3.1
T.U.C. ^e	828	17.8	1,080	23.2	1,610	34.5	1,730	37.1
Wholesale trade	545	10.8	580	11.5	700	13.9	720	14.3
Retail trade	2,157	19.7	2,250	20.3	2,960	27.0	3,100	28.3
F.I.R.E. ^f	349	5.6	360	5.7	460	7.3	480	7.6
All other ^g	2,905	38.1	3,200	42.0	4,000	52.5	4,200	55.1
All covered employment ^a	13,406	254.8	16,900	348.8	29,400	648.0	31,300	700.5
Johnson County								
Coal mining	—	—	—	—	—	—	—	—
Other mining ^d	480	8.6	460	8.3	660	11.9	660	12.0
Construction	245	3.5	240	3.4	250	3.6	250	3.6
Manufacturing	91	1.3	90	1.3	90	1.3	90	1.3
T.U.C. ^e	85	1.4	110	1.8	120	2.0	120	2.0
Wholesale trade	28	.4	30	.4	40	.5	40	.5
Retail trade	413	2.9	420	3.0	460	3.3	470	3.3
F.I.R.E. ^f	94	1.2	100	1.3	110	1.4	120	1.5
All other ^g	349	7.9	930	8.7	1,130	10.6	1,180	11.0
All covered employment ^a	2,285	27.2	2,380	28.2	2,860	34.6	2,930	35.2
Sheridan County								
Coal mining	300	7.5	440	11.0	1,840	46.2	1,840	46.2
Other mining ^d	80	2.0	80	2.0	80	2.0	80	2.0
Construction	1,127	18.6	1,110	18.3	1,350	22.3	1,300	21.5
Manufacturing	493	7.3	490	7.2	530	7.8	530	7.8
T.U.C. ^e	306	5.1	400	6.6	450	7.4	450	7.4
Wholesale trade	339	4.9	350	5.0	400	5.7	400	5.7
Retail trade	1,958	15.9	2,000	16.2	2,360	19.2	2,400	19.5
F.I.R.E. ^f	390	5.6	400	5.8	490	7.1	490	7.1
All other ^g	3,160	35.6	3,500	39.4	4,400	49.6	4,500	50.7
All covered employment ^a	8,153	102.5	8,800	111.5	11,900	167.3	11,990	167.9
Montana employment								
Residing in Sheridan County ^h	485	13.8	750	21.1	2,940	61.2	1,590	44.6

PROJECTED TRENDS IN COVERED EMPLOYMENT AND SALARIES AND WAGES FOR BENCHMARK YEARS
(continued)

- a. "Covered employment" is employment that is covered by unemployment insurance, as reported for the county of employment by the Wyoming Employment Security Commission (WESC).
- b. Except for the estimate of coal employment and the estimate of Montana employment residing in Sheridan County, all 1980 employment is actual employment reported by the WESC. The estimate of coal employment is based on industrial planning or the relative weight of coal mining compared to all mining in the county. The estimate of Montana employment residing in Sheridan County is based on the industrial estimate of Big Horn County, Montana employees residing in Sheridan County in 1982 (about 50%). All salaries and wages are actual 1980 salaries and wages as reported by the WESC and the Employment Security Division of the Montana Department of Labor and Industry (MDLI).
- c. All employment projections are from Alternative 6 of the round two, 1984 sale, Powder River DEIS as derived from the Casper District input-output model. Projections of Montana employment residing in Sheridan County are the result of applying the percentage stated in footnote "b" to the employment forecast for new projections in Big Horn and southern Powder River counties of Montana. All projections of salaries and wages are based on 1980 average weekly wages as reported by the WESC and the MDLI.
- d. Includes oil and gas extraction, uranium, bentonite, and other miscellaneous mining activity.
- e. Transportation, utilities, and communications.
- f. Finance, insurance, and real estate.
- g. Includes services (moteis, hotels, restaurants, theaters, repair service and other services), state and local government, forestry and fisheries, and some agriculture.
- h. Because "covered employment" is reported by county of employment, this is not included in Sheridan County employment.

Affected Environment

TABLE 3-28
PROJECTED POPULATION TRENDS WITH HOUSING REQUIREMENTS FOR BENCHMARK YEARS
IN THE BUFFALO RESOURCE AREA

	1980		1985		1990		1995	
	Popula- tion	Housing	Popula- tion	Housing	Popula- tion	Housing	Popula- tion	Housing
Campbell County	24,367	9,505	31,900	12,400	54,700	21,300	59,100	23,100
Gillette	12,134	4,857	15,900	6,400	27,300	10,900	29,400	11,800
Johnson County	6,700	3,029	7,000	3,200	8,400	3,800	8,600	3,900
Buffalo	3,799	1,673	3,900	1,720	4,800	2,110	4,900	2,160
Sheridan County								
Montana em- ployees ^a	1,410	620	2,180	950	5,800	2,530	4,600	2,010
Base popula- tion	23,600	10,300	25,300	11,000	34,500	15,100	34,800	15,200
Sheridan County	total	25,047	10,928	27,500	12,000	40,300	17,600	39,400
Sheridan		15,146	6,604	16,600	7,200	24,300	10,600	23,800
								10,400

NOTE: Population projections were derived by applying the 1980 population-to-employment ratio to projected employment. For Campbell County the ratio was 1.888 for permanent employment plus 1.209 for temporary employment. For Johnson County the ratio was 2.932 for all employment. For Sheridan County the ratio was 2.8997 for permanent employment plus 1.2085 for temporary employment.

City populations are projected on the basis of 1980 ratio of city population to county population. Estimates of Montana employees residing in Sheridan County are based on Montana industrial estimates of the number of employees residing in Sheridan County in 1982. Housing requirements are based on the 1980 ratio of persons per house. The 1980 county and community populations are from the 1980 census.

a. "Montana employees" are persons living in Sheridan County who work in Montana.

TABLE 3-29
LOCAL EXPENDITURE LEVELS IN 1979-1980
FOR THE BUFFALO RESOURCE AREA
WITH PROJECTIONS FOR BENCHMARK YEARS
(in thousands of dollars)

	1979 ¹	1985 ²	1990 ²	1995 ²
Campbell County	13,681.1	18,800	32,300	34,900
School District 1	35,852.2	49,300	84,600	91,400
Gillette	10,122.0	14,000	24,000	25,900
Johnson County	2,062.3	2,200	2,600	2,700
School District 1	5,646.8	6,000	7,200	7,400
Buffalo	1,902.3	2,000	2,500	2,500
Sheridan County	14,724.3	16,700	24,400	23,900
School District 2	9,898.8	11,200	16,400	16,000
Sheridan	7,143.8	8,100	11,800	11,600

¹Actual expenditures reported by local entities, which includes debt servicing.

²Projects are based on 1979 per capita expenditure levels.

Affected Environment

TABLE 3-30
COMMUNITY SERVICE LEVELS IN 1979-1980 FOR THE BUFFALO RESOURCE AREA
WITH PROJECTED REQUIREMENTS FOR BENCHMARK YEARS

	1979-1980	1985	1990	1995
<u>School Enrollment</u>				
Gillette	4,570	6,000	10,300	11,100
Buffalo	1,392	1,430	1,760	1,800
Sheridan	3,352	3,700	5,400	5,300
<u>Hospital Beds</u>				
Gillette	31 ^a	41	70	75
Buffalo	35	36	44	45
Sheridan	97	106	156	152
<u>Sworn Law Officers</u>				
Campbell County	25	33	56	61
Gillette	31	41	70	75
Johnson County	8	8	10	10
Buffalo	7	7	9	9
Sheridan County	7	8	11	11
Sheridan	29	32	47	46
<u>Firefighters</u>				
Gillette: fulltime	5	7	11	12
: volunteer	22	29	49	53
Buffalo: fulltime	--	--	--	--
: volunteer	17	17	21	22
Sheridan: fulltime	18	20	29	28
: volunteer	--	--	--	--
<u>Water Capacity (MGPD)^b</u>				
Gillette	3.6 ^c	4.7	8.1	8.7
Buffalo	3.8 ^d	3.9	4.8	4.9
Sheridan	10.0	11.0	16.0	15.7
<u>Sewage Capacity (MGPD)^b</u>				
Gillette	1.7 ^e	2.2	3.8	4.1
Buffalo	0.6 ^f	0.6	0.8	0.8
Sheridan	5.0	5.5	8.0	7.9

NOTE: All data for 1979-1980 are from the Wyoming Department of Economic Planning and Development.

All projections are made on the basis of 1979-1980 levels per thousand population.

- a. Expanding to 60 beds.
- b. Million gallons per day.
- c. After completion of the Madison Project, the city of Gillette now has 10.1 MGPD of water.
- d. Represents peak demand.
- e. A study has been undertaken for the construction of sewage treatment facilities with capacity for 7.4 MGPD.
- f. Sewage facilities are scheduled to be rebuilt between 1981 and 1983.

Table 3-36 presents the percentage of inventory grazing requirement that is furnished by BLM for each county. This percentage should not be compared to the percentage of feed dependency footnoted for tables 3-33, 3-34, and 3-35 because

the feed dependencies are based on samplings of operations in specific localities, while the percentage of grazing requirements furnished by the BLM is derived as if all operators in the county had a share.

Affected Environment

TABLE 3-31
ESTIMATES OF 1980 CASH RECEIPTS FOR MAJOR AGRICULTURAL COMMODITIES
IN THE BUFFALO RESOURCE AREA BY COUNTY ^a

	Campbell County	Johnson County	Sheridan County
	(\$ 1,000)	(\$ 1,000)	(\$ 1,000)
Cattle and calves ^b	21,840	16,640	23,200
Hogs ^c	60	40	100
Sheep and lambs ^d	1,310	2,440	570
Wool ^e	570	1,060	250
Barley ^f	290	90	380
Corn ^f	---	---	---
Dry beans ^f	---	---	---
Hay ^f	290	750	830
Oats ^f	50	50	60
Sugar beets ^f	---	---	---
Wheat ^f	1,760	100	470
Dairy products ^g	130	130	1,340
Total	26,300	21,300	27,400

a. Based on distribution of total receipts for each commodity in the state of Wyoming for 1980 as reported by the Wyoming Crop and Livestock Reporting Service/USDA in Wyoming Agricultural Statistics, 1981, and applied to total agricultural sales taken from the Casper District input-output model. Does not include receipts for poultry and eggs or other miscellaneous commodities. Commodity categories presented represent 98.6 percent of total Wyoming receipts for 1980. Columns may not add due to rounding.

b. The disaggregation of total Wyoming cash receipt for cattle and calves was accomplished on the basis of the summation of the county's share of all cattle and calves, all cows that have calved, and cattle and calves moved on brand certificates by county of origin in 1979.

c. The disaggregation of total Wyoming cash receipts for hogs was accomplished on the basis of trends in the county's share of total hogs between 1972 and 1976.

d. The disaggregation of total Wyoming cash receipts for sheep and lambs was accomplished on the basis of the summation of the county's share of all stock sheep and sheep and lambs moved on brand certificates by county of origin in 1979.

e. Total Wyoming cash receipts for wool were disaggregated on the basis of the county's share of stock sheep in 1979.

f. Total Wyoming cash receipts for the various crops were disaggregated on the basis of the county's share of the crop's production in 1979.

g. Total Wyoming cash receipts for dairy products were disaggregated on the basis of the county's share of milk and cows in 1979.

TABLE 3-32
GROSS RETURN FOR SUPPORTING AN ANIMAL UNIT (AU) IN INVENTORY
FOR ONE MONTH IN THE BUFFALO RESOURCE AREA
Five-Year Average (1975-1979)

	Cattle	Sheep	Mule Deer	White-Tailed Deer	Antelope	Elk	Overall	
Campbell County								
5-year cumulative inventory ^a	(AUs)	305,000	88,000	30,000	1,400	38,000	600	463,000
5-year cumulative returns ^b	(\$1,000)	93,400	12,100	6,300	90	8,300	-0-	120,000
Average annual return to an AU ^c	(\$)	306	138	210	64	218	-0-	259
Average monthly return to an AU ^d	(\$)	26	12	18	5	18	-0-	22
Johnson County								
5-year cumulative inventory ^a	(AUs)	247,000	122,000	41,000	5,100	19,000	11,000	445,000
5-year cumulative returns ^b	(\$1,000)	69,500	17,200	7,900	500	6,200	3,200	105,000
Average annual return to an AU ^c	(\$)	281	141	193	98	326	291	236
Average monthly return to an AU ^d	(\$)	23	12	16	5	27	24	20
Sheridan County								
5-year cumulative inventory ^a	(AUs)	296,000	24,000	24,000	4,100	3,200	13,000	364,000
5-year cumulative returns ^b	(\$1,000)	95,600	3,600	4,500	400	3,900	3,700	109,000
Average annual return to an AU ^c	(\$)	323	150	188	98	281	285	299
Average monthly return to an AU ^d	(\$)	27	13	16	8	23	24	25

a. This is the sum of the beginning year inventories for the five-year period. Figures have been converted to animal units by standard BLM factors. For purposes of this study only, animal unit equivalents are as follows:

1 800-pound cow with or without calf	= 1 AU	4 mule deer	= 1 AU
1 bull	= 1.2 AUs	4.5 white-tailed deer	= 1 AU
1 heifer or steer heavier than 500 pounds	= 0.7 AU	1.25 elk	= 1 AU
1 calf lighter than 500 pounds	= not counted	5 antelope	= 1 AU
5 sheep	= 1 AU		

Estimates of animal units in cattle and sheep are based on beginning year inventories by county as published by the Wyoming Crop and Livestock Reporting Service/USDA, in *Wyoming Agricultural Statistics*. Estimates of animal units in wildlife are based on beginning year inventories that were converted from data furnished as the post-harvest populations of herd units for the five-year period between 1974 and 1978 by Wyoming Game and Fish Department.

b. For cattle or sheep, this represents the sum of gross receipts during the 5-year period. Figures were derived from data published by the Wyoming Crop and Livestock Reporting Service/USDA, in *Wyoming Agricultural Statistics*. The value for sheep includes gross receipts for wool.

For wildlife, this is the sum of sportsman expenditures for the same period. Figures were derived from data furnished by Wyoming Game and Fish Department on a herd unit basis. The return to an AUM in wildlife should be viewed as the return to the economy in the state of Wyoming.

c. Returns divided by inventory.

d. Return to an animal unit (AU) divided by 12.

TABLE 3-33
 CAMPBELL COUNTY
 ESTIMATED NET RETURN TO AN ANIMAL UNIT (AU) IN INVENTORY
 FOR 75, 400, AND 1,000 COW ENTERPRISES^a

	75 Cows 98 AU ^b	400 Cows 519 AU ^c	1,000 Cows 1,298 AU ^d
Gross return to inventory at \$306.00 per AU ^e	\$ 29,988	\$158,814	\$397,188
less operating costs:			
BLM fee	\$ 175	\$ 930	\$ 2,317
Forest Service fee	213	1,162	2,939
State lease	204	1,122	3,013
Private lease	---	8,742	25,493
Hay, produced	---	8,639	19,501
Hay, purchased	4,644	9,615	21,697
Protein supplement	5,094	23,698	76,924
Salt and mineral	107	566	1,402
Vet and medicine	301	1,998	3,595
Hired trucking	127	991	3,621
Marketing	237	16	4,231
Fuel and lube	1,634	7,795	12,188
Repairs	1,129	6,674	14,499
Taxes	956	5,034	11,747
Insurance	625	3,337	8,035
Farm overhead	1,936	3,119	649
Hired labor	608	6,067	20,132
Interest on operating capital	1,217	3,896	13,992
Total operating costs	19,217	95,401	245,975
Return after operating costs	10,771	63,413	151,213
Less other costs			
Family labor	2,761	7,712	8,216
Depreciation	3,966	20,776	51,323
Interest on land investment	21,054	106,644	264,364
Interest on other investment	10,431	56,197	134,706
Total other costs	38,212	191,329	458,609
Net return after all costs	-\$27,441	-\$127,916	-\$307,396
Net return to an AU ^f	-\$280.01	-\$246.47	-\$236.82

a. This is a composite budget reflecting the general character of Campbell County and intended to represent an average budget for this type of operation in the county to the extent possible. It is based on the five-year (1975-1979) average return to an animal unit in inventory as applied to estimated 1979 expenses. The basic costs were derived from budgets that were developed by the Economic Research Service, USDA, for Operations in the Thunder Basin National Grasslands.

b. Feed Dependency: 7.7% BLM lease; 5.1% Forest Service lease; 7.8% state lease; 47.4% deeded acreage; 19% purchased hay; 7.5% protein supplement; 5.5% miscellaneous, including crop residue.

c. Feed Dependency: 7.7% BLM lease; 5.1% Forest Service lease; 7.8% state lease; 12.1% private lease; 36.2% deeded acreage; 8.0% purchased hay; 11.0% produced hay; 6.6% protein supplement; 5.5% miscellaneous, including crop residue.

d. Feed Dependency: 7.7% BLM lease; 5.1% Forest Service lease; 7.8% state lease; 14.6% private lease; 33.5% deeded acreage; 7.0% purchased hay; 10.0% produced hay; 8.8% protein supplement; 5.5% miscellaneous, including crop residue.

e. See table 3-32.

f. Obtained by dividing "Net Return After All Costs" by the number of animal units in the inventory.

TABLE 3-34
 JOHNSON COUNTY
 ESTIMATED NET RETURN TO AN ANIMAL UNIT (AU) IN INVENTORY
 FOR 75, 400, AND 1,000 COW ENTERPRISES^a

	75 Cows 98 AU ^b	400 Cows 516 AU ^c	1,000 Cows 1,287 AU ^d
Gross return to inventory at \$281.00 per AU ^e	\$ 27,538	\$144,966	\$361,647
less operating costs:			
BLM fee	\$ 428	\$ 2,314	\$ 5,763
Forest Service fee	495	2,641	6,631
State lease	197	1,103	2,909
Private lease	40	5,567	17,895
Hay, produced	409	10,367	21,147
Hay, purchased	4,174	9,078	19,983
Protein supplement	3,246	15,087	49,793
Salt and mineral	107	361	1,368
Vet and medicine	298	1,955	3,535
Hired trucking	125	970	2,798
Marketing	15	154	4,132
Fuel and lube	1,562	7,420	11,345
Repairs	1,086	6,239	13,311
Taxes	981	5,101	11,589
Insurance	591	3,143	7,511
Farm overhead	1,783	3,067	1,326
Hired labor	604	5,963	19,716
Interest on operating capital	1,150	5,538	12,972
Total operating costs	17,511	86,368	213,654
Return after operating costs	10,027	58,628	147,993
Less other costs			
Family labor	2,746	7,581	8,047
Depreciation	3,732	19,594	47,197
Interest on land investment	21,688	108,972	261,709
Interest on other investment	9,706	52,071	123,396
Total other costs	37,872	188,218	440,949
Net return after all costs	-\$27,845	-\$129,590	-\$292,956
Net return to an AU ^f	-\$284.13	-\$251.14	-\$227.63

a. This is a composite budget reflecting the general character of Johnson County and intended to represent an average budget for this size of operation in the county to the extent possible. It is based on the five-year (1975-1979) average return to an animal unit in inventory as applied to estimated 1979 expenses. The basic costs were derived from budgets that were developed by the Economic Research Service, USDA, for Operations in the Thunder Basin National Grasslands and the Bighorn National Forest.

b. Feed Dependency: 19.2% BLM lease; 12.3% Forest Service lease; 7.9% state lease; 0.3 private lease; 33.1% deeded acreage; 17.1% purchased hay; 2.8 produced hay; 4.8% protein supplement; 2.5% miscellaneous, including crop residue.

c. Feed Dependency: 19.2% BLM lease; 12.3% Forest Service lease; 7.9% state lease; 7.7% private lease; 25.2% deeded acreage; 7.5% purchased hay; 13.3% produced hay; 4.2% protein supplement; 2.7% miscellaneous, including crop residue.

d. Feed Dependency: 19.2% BLM lease; 12.3% Forest Service lease; 7.9% state lease; 10.2% private lease; 24.5% deeded acreage; 6.4% purchased hay; 11.0% produced hay; 5.8% protein supplement; 2.7% miscellaneous, including crop residue.

e. See table 3-32.

f. Obtained by dividing "Net Return After All Costs" by the number of animal units in the inventory.

TABLE 3-35
 SHERIDAN COUNTY
 ESTIMATED NET RETURN TO AN ANIMAL UNIT (AU) IN INVENTORY
 FOR 75, 400, AND 1,000 COW ENTERPRISES^a

	75 Cows 104 AU ^b	400 Cows 555 AU ^c	1,000 Cows 1,388 AU ^d
Gross return to inventory at \$323.00 per AU ^e	\$ 33,592	\$179,265	\$448,324
less operating costs:			
BLM fee	\$ 72	\$ 403	\$ 1,007
Forest Service fee	1,003	5,329	13,351
State lease	355	2,062	5,377
Private lease	81	4,133	15,368
Hay, produced	859	13,030	24,726
Hay, purchased	3,939	9,253	19,734
Protein supplement	2,396	11,051	37,612
Salt and mineral	113	602	1,496
Vet and medicine	314	2,099	3,780
Hired trucking	131	1,020	2,982
Marketing	247	314	4,389
Fuel and lube	1,584	7,629	11,447
Repairs	1,099	6,480	13,219
Taxes	1,066	5,589	12,436
Insurance	593	3,193	7,615
Farm overhead	1,735	3,263	2,158
Hired labor	636	6,341	21,002
Interest on operating capital	1,151	5,611	13,027
Total operating costs	17,376	87,401	210,726
Return after operating costs	16,216	91,864	237,598
Less other costs			
Family labor	2,899	8,061	8,572
Depreciation	3,720	19,942	46,962
Interest on land investment	23,633	120,351	281,806
Interest on other investment	9,559	51,950	123,517
Total other costs	39,841	200,304	460,857
Net return after all costs	-\$23,625	-\$108,440	-\$223,259
Net return to an AU ^f	-\$227.16	-\$195.39	-\$160.85

a. This is a composite budget reflecting the general character of Sheridan County and intended to represent an average budget for this size of operation in the county to the extent possible. It is based on the five-year (1975-1979) average return to an animal unit in inventory as applied to estimated 1979 expenses. The basic costs were derived from budgets that were developed by the Economic Research Service, USDA, for Operations in the Thunder Basin National Grasslands and the Bighorn National Forest.

b. Feed Dependency: 3.1% BLM lease; 24.4% Forest Service lease; 14.1% state lease; 0.5% private lease; 26.0% deeded acreage; 15.1% purchased hay; 5.6% produced hay; 3.3% protein supplement; 7.9% miscellaneous, including crop residue.

c. Feed Dependency: 3.1% BLM lease; 24.4% Forest Service lease; 14.1% state lease; 5.3% private lease; 18.5% deeded acreage; 7.0% purchased hay; 15.6% produced hay; 2.9% protein supplement; 9.1% miscellaneous, including crop residue.

d. Feed Dependency: 3.1% BLM lease; 24.4% Forest Service lease; 14.1% state lease; 8.1% private lease; 20.3% deeded acreage; 5.8% purchased hay; 12.0% produced hay; 4.1% protein supplement; 8.1% miscellaneous, including crop residue.

e. See table 3-32.

f. Obtained by dividing "Net Return After All Costs" by the number of animal units in the inventory.

Affected Environment

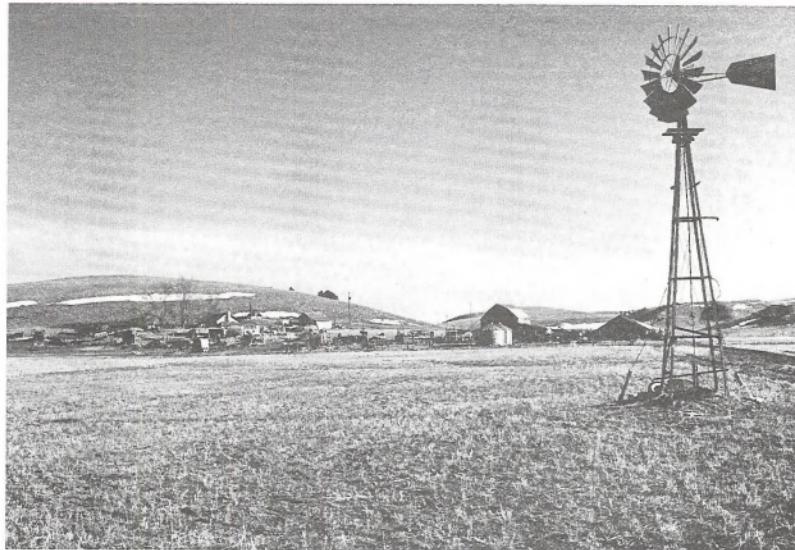
TABLE 3-36

COMPARISON OF ANIMAL UNIT MONTHS LEASED BY THE BLM
IN THE BUFFALO RESOURCE AREA IN 1983
TO THE AVERAGE TOTAL INVENTORY REQUIREMENT

	Campbell County	Johnson County	Sheridan County
Animal unit months (AUMs) leased by BLM	37,851	47,115	5,108
Potential number of animal units (AUs) supported ¹	3,154	3,926	426
Average beginning year inventory ² (AUs)	78,600	73,800	64,000
Percentage of average beginning year inventory requirements provided by BLM	4.0	5.3	0.7

¹AUMs divided by 12.

²This is the five-year cumulative inventory from table, divided by 5. Includes
cattle and sheep AUs.

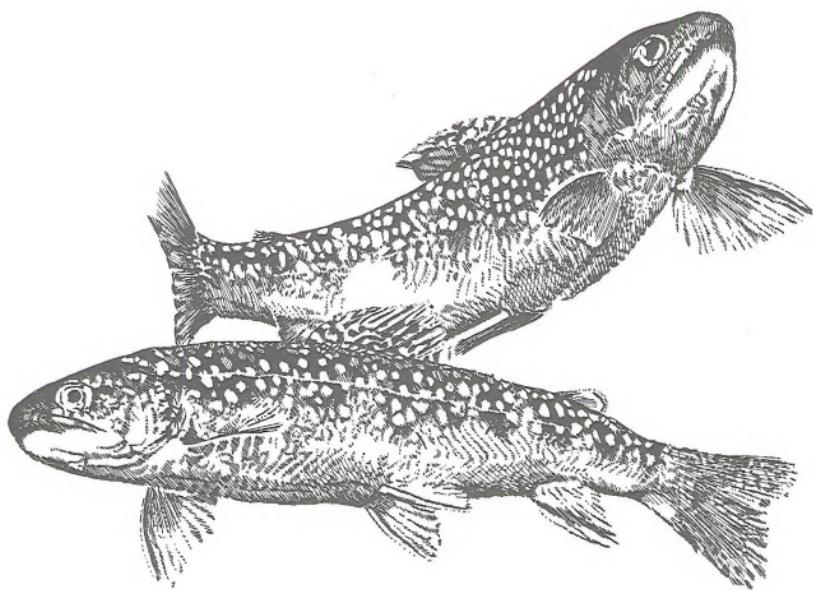




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Chapter Four

Environmental Consequences



ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter presents the environmental consequences of implementing each RMP alternative. Effects are described for each resource or land use affected by program management actions of the alternative; then cumulative impacts on that resource or land use are discussed.

For the purpose of analysis, short-term effects are defined as those lasting ten years or less; long-term effects are those that would extend beyond the ten-year life of this plan. If irreversible or irretrievable commitments of resources or unavoidable adverse effects are not discussed in the text, it can be assumed that there would be no such effects.

Similarly, if the discussion of effects on a given resource or land use does not include effects caused by a particular program, that program would have no significant effect on that resource or land use. The probability that an impact will occur is indicated according to the following terms: unlikely (10-29% probability), low (30-59%), moderate (60-79%), or high (80-100%).

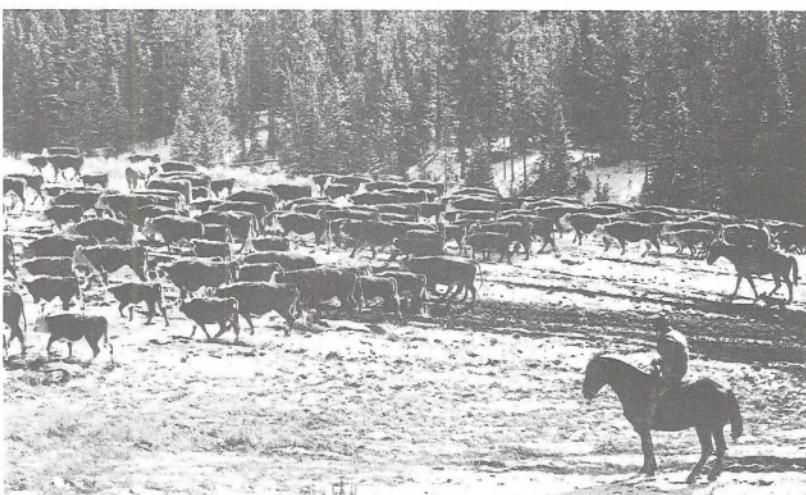
The analyses presented in this chapter were based on available information and on the professional judgment of resource specialists.

Coal lease sales and leasing levels are not addressed in this EIS. Coal leasing in the Powder River Basin, which includes Johnson, Campbell, and Sheridan counties, is discussed in the *Draft EIS for Round II Coal Lease Sale in the Powder River Region* (USDI, BLM 1984a). It can be assumed that coal leasing and development will continue at the levels addressed by the coal EIS.

The impacts identified for the preferred alternative in the 1984 coal EIS are summarized in appropriate sections in the evaluation of the consequences of the RMP "no action" alternative. Assuming the second round Powder River coal lease sale will be completed, these impacts would apply to all the RMP alternatives. Should there be another lease sale in the future, the impacts from future leasing levels would be evaluated in another coal EIS.

The impacts from potential leasing addressed in this RMP are general. The screening process does not indicate BLM plans to lease certain areas.

After a federal tract is leased, a mine plan EIS must be written for each proposed mine.



ALTERNATIVE A: NO ACTION

EFFECTS ON AIR RESOURCES

Air quality would be affected by such actions as prescribed burning, spraying for control of weeds and grasshoppers, and blowing dust from road, pipeline, and drill pad construction. These impacts would be very localized and usually would last for less than a week. The probability of their being noticeable and annoying would be low.

Fugitive dust from coal mining would cause localized reduction in air quality. The impact would be expected to decrease rapidly beyond the mine boundaries. Wyoming 24-hour standards probably would be violated in some areas. This would be an unavoidable adverse effect. The draft coal EIS for the second round lease sale (USDI, BLM 1984a) addresses the effects of additional coal leasing.

In the area southeast of Reno Junction, the Wyoming 24-hour standard would be violated around Jacobs Ranch Mine, west of the Black Thunder Mine, and around the Thundercloud tract.

In the area south of Gillette, the Wyoming standard would be violated in 1990, 1995, and 2000 east of Belle Ayr and Caballo Rojo, east of Kintz Creek, and between Mount Logan and Coal Creek.

In the area north of Gillette, the Wyoming 24-hour standard would be violated in 1990 and 1995 between North Rawhide and Eagle Butte. Violations of the 24-hour standard would occur in 2000 east of Buckskin.

EFFECTS ON CULTURAL RESOURCES

Most sites in the resource area would be protected under the "no action" alternative through compliance with all applicable laws, regulations, and policies. However, this alternative would not provide for awareness programs to inform the public about cultural resources, nor would it provide for planned data recovery projects to supply additional scientific information.

The cutting of "cat" lines by dozers for fire control could have an adverse effect on cultural

resources. However, since only approximately 5 acres per year are disturbed for "cat" lines, the potential of actually damaging a significant site is considered small.

Since cultural inventories and mitigation are required on public surface before surface-disturbing activities are authorized, such activities might have a positive effect on the cultural resource program because more sites would be identified and protected. Activities for which cultural inventories are not required (such as geophysical operation, which involves driving across land and drilling) might damage or destroy sites. However, the probability of this occurring is low because less than 500 acres per year of public land would be involved.

Some types of cultural resources might be destroyed by livestock use. For example, standing historic structures could be knocked down or damaged by livestock. The probability of such an impact is low because few structures remain on BLM-administered surface.

Cultural inventories are required before land sales and right-of-way actions. Therefore, such actions could benefit cultural resources by causing sites to be identified and adding to the base of information. Once sites are identified, mitigative measures can be proposed to preserve the scientific information for public benefit.

Recreational use would increase occurrences of vandalism to cultural sites, causing loss of information. However, the potential for this is low; it is not likely to happen. Damages rarely occur from accidental discovery of sites and deliberate disturbance.

While the minerals program has the greatest potential of any BLM activity for disturbing cultural sites, it also has the potential of bringing the greatest benefits to the cultural program, because a cultural resource inventory is required before any activity involving surface disturbance begins. As new sites are identified, additional scientific information is gained, and analysis may be completed. This contributes to the understanding of the prehistory and history of the resource area.

The possible adverse effects on cultural resources from coal development as listed by the Advisory Council on Historic Preservation, are destruction or alteration of all or part of a property; isolation from or alteration of its surrounding environment; or introduction of visual, audible, or

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atmospheric elements that are out of character with the property or alter its setting (36 CFR 800.9). Possible effects are not limited to these, and each project must be evaluated to determine effects on specific cultural resources. Cultural resource inventories and compliance required by the Historic Preservation Act of 1966 and Executive Order 11593 must be conducted before any federal action that authorized surface disturbance can be approved.

Descriptions of sites by tract are included in the individual coal tract profiles (USDA, FS and USDI, BLM var.). Although a number of cultural sites are known, until an intensive resource inventory has been done for each tract, no accurate quantification of the potential impacts can be made.

Salvage of cultural resources allows recovery of a portion of the scientific data present. However, under current research methods and priorities, sites or potential data within sites that would have been important to future research might be overlooked, and some sites not selected for salvage might be destroyed with recovery of only preliminary data. In this way, valuable cultural resources could be lost.

Burying cables, as may be required for visual resource management, has the potential of disturbing buried cultural deposits. However, the probability of this happening is low. Camouflage painting helps to preserve the visual integrity around cultural sites.

The stipulation that surface disturbance must be at least 500 feet from surface water would have a beneficial effect on cultural resources, because it leaves them undisturbed. Nearly half the cultural sites in the resource area are found near water.

Wildlife habitat management that involves year-round "no surface occupancy" restrictions benefits cultural resources because such stipulations also protect any cultural sites present. Consequently, 39,500 acres possibly containing cultural sites would be protected.

Cumulative effects on cultural resources would occur from surface-disturbing activities associated with fire, forest, grazing, lands, recreation, minerals, and visual resource management. These impacts should be minimal and the probability of their occurring is low. Approximately 69,720 acres of known cultural sites would be protected.

Alternative A would adequately ensure compliance with all laws, regulations, and policies requiring cultural protection. In general, the



activities proposed by this alternative would benefit the cultural program by causing new sites to be identified and thereby increasing our knowledge of regional prehistory and history.

EFFECTS ON LAND USES

Effects on Forestry

Under Alternative A the BLM would offer of approximately 6.6 MMBF of green timber and about 1 MMBF of dead timber from commercial forestlands over the next ten years. Problems arise in implementation of the harvest schedule as outlined in the south Big Horns timber harvest plan. Inability to acquire easements and changing market conditions either have prevented the offer-

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ing of sales in their designated years or have caused sales to be offered when market conditions might have indicated that a delay would be advisable.

Setting aside 30,000 acres of woodland for wildlife use and for aesthetic and watershed purposes would cause the resource area to forgo offering approximately 1 MMBF of green timber and 500 MBF of dead timber over the next ten years.

Implementation of forest development projects and acquisition of easements for timber harvest roads would support the proposed harvest and therefore benefit the forestry program.

Livestock grazing on commercial forestlands in certain cases is impairing the productive capacity of BLM-managed commercial forestland. Livestock affect forestlands by browsing and trampling young trees and by compacting the soils. The impacts are not widespread over all the commercial forestlands; they occur at scattered small sites.

No significant adverse effects are projected to occur in the short term. However, in the long term, continued grazing would result in a measurable decline in wood fiber yields on the affected forestlands.

Oil and gas development on commercial forest-lands could cause unavoidable adverse effects if timber harvests had to be postponed or volumes reduced. Such effects could occur if construction of drilling locations and access roads caused timber depletion. There is a minimal chance that oil and gas development could occur on commercial forestlands in the south Big Horns in the next ten years. The impacts associated with possible oil and gas development on commercial forestlands would be reversible, but not until the oil and gas resources were depleted.

Cumulative effects on forestry under Alternative A would be a possible decline in timber sale offerings at a time when the demand for timber is expected to increase. The demand has increased over the past several years and is projected to continue to increase by the Forest Service and other agencies. Public demand for fuelwood is increasing yearly.

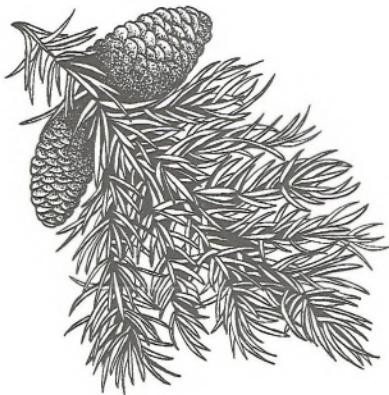
Effects on Grazing

The BLM would authorize livestock grazing on approximately 760,000 acres of public land at the full MRB-rated stocking rate of 94,545 AUMs under Alternative A. An estimated 20 to 25% of the allotments and 5% of the stock driveway would remain in less than good condition, and some allotments would remain below their productive potential. Satisfactory resource conditions would continue on 461,427 acres, of which 161,000 acres is in "I" category allotments. This alternative would not meet the forage need for the objective wildlife population, which is estimated at 2,400 AUMs on 23 allotments.

An indirect benefit to woolgrowers would continue through continued cooperation in predator control operations. Control work is applied to a management unit consisting of intermingled federal, state, and private land.

Timber harvest operations and reforestation restrictions could disrupt the normal use and management of portions of grazing allotments. This could occur if large exclosures (more than 100 acres) constructed to protect forest sites should block access to areas important for livestock, such as water. Two to three livestock operations per year would be affected.

Land sales would not normally result in a change of land use, so no reduction in the resource area's forage production base would be expected.



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Development of land under the R&PP program would result in a long-term reduction of the resource area forage production base by 150 AUMs. About 1,000 acres in Gillette, Buffalo, and Sheridan would be involved.

Surface disturbance by coal mining would remove about 300 AUMs per year from the resource area's forage production; however, since mined lands are normally reclaimed within five years, the long-term reduction in forage production from coal mining would be minimal. According to industry sources, forage production from reclaimed lands at least equals and usually exceeds the premining production.

Mineral material disposal, oil and gas exploration production, right-of-way construction, and range improvement construction would cause a reduction of 150 AUMs per year in the forage production base on public land. This effect would last from three to five years.

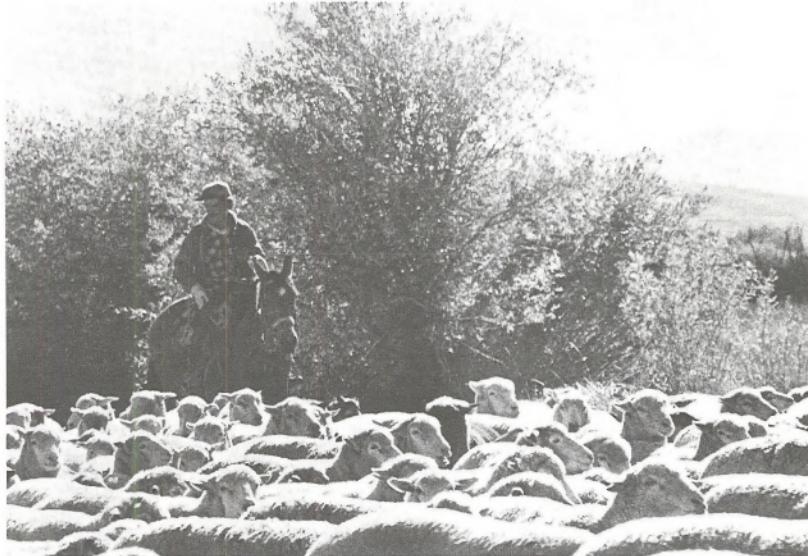
Control of wildfire, noxious weeds, and grasshopper infestations would increase the forage

production base on public land by a maximum of 100 AUMs per year.

Acquisition of public access would cause an unquantifiable negative effect on livestock operators on five to ten grazing allotments. Increased access could be expected to cause a substantial increase in conflicts between recreation users and livestock operators over such problems as open gates, disturbance of stock, and damage to facilities.

Reclamation and surface disturbance stipulations applied to such activities as oil and gas development, mineral material disposal, and rights-of-way, would generally benefit livestock grazing. Such provisions as slope development restrictions, ripping, and reseeding would reduce surface disturbance or facilitate reestablishment of vegetation on 380 acres of public surface per year.

The cumulative effects on livestock grazing from this alternative would be an insignificant loss of forage production. The net loss is estimated at less than 200 AUMs, 0.01% of the resource area's total forage (estimated at 2 million AUMs).



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Effects on Lands and Realty

Establishment of corridors provides the long-term benefit for right-of-way applicants of arranging acceptable routes in advance for major facilities so that environmental problems can be minimized. The probability of corridors being used by major facilities during the life of this plan is high; however, little development is occurring at this time because of the economic situation.

Requirements for organized utilization of the Pumpkin Buttes communication site could cause potential applicants to seek communication sites elsewhere to avoid sharing a tower with others. This could mean that the BLM would not collect potential revenues. However, the plan would have a beneficial effect in that a scarce resource would be managed.

Sale and exchange of specified public lands in Campbell County would have a long-term, beneficial effect for the BLM and for the public. The sale or exchange of isolated tracts that are difficult to manage would help consolidate complex land ownership patterns. The Campbell County government would lose revenue from payment in lieu of taxes, but the loss would be offset by taxes paid by private parties. Because Alternative A does not address the sale or exchange of public lands in Johnson and Sheridan counties, this alternative offers no opportunity for the BLM to improve management by disposing of parcels that are not economic to manage or by consolidating lands through exchanges.

Erosion control measures would have short-term adverse impacts in the form of added expenses to grant holders. Some of the requirements and approximate additional costs to the grant/permit holders are listed below. It should be noted that some operators feel that some or all of the expenses of these requirements are offset by the ease and success of reclamation.

Mulching sandy soil: \$350 per acre for straw mulch

Ripping roads to break up compaction: \$75 per hour, or \$75 for approximately 1-1/2 miles of road

Reseeding with native grasses instead of introduced species: native species range from \$7.20 per pound for little bluestem to \$2.60 per pound for western wheatgrass

Weed removal: as much as \$100 per acre

The probability that expenses for mulching sandy soil and ripping roads would be incurred is

low. Reseeding with native species would be done in all cases.

Wildlife habitat management generally affects the lands and realty program in two ways—delays in construction or changes in routing. Seasonal restrictions on construction activities affect the following approximate acreages: 14,000 acres for raptor nests on federal surface, 46,000 acres for critical winter ranges for elk on federal surface, 600 acres for elk calving areas, 8,000 acres for sage grouse habitat, and 800 acres for sharp-tailed grouse.

When seasonal restrictions prevent construction of pipelines at the time required, the BLM might have to require that operators "shut in" gas wells and haul over roads in poor condition from the spring thaw. This would result in short-term adverse impacts.

Restricted areas are scattered. The probability that construction activities would be affected is low.

Surface occupancy on federal surface would cause long-term adverse impacts on the following approximate acreages: 3,800 acres for elk calving areas, 200 acres for sage grouse leks, 80 acres for sharp-tailed grouse leks, and 4,000 acres for big game winter ranges. Grantees would be required to route pipelines and other facilities around these areas. The approximate costs for rerouting are discussed in the next paragraph. Additional expenses would be incurred for such items as archeological surveys (approximately \$150 for 1/4 mile) and for construction and materials for longer routes.

Approximate costs for representative linear rights-of-way are as follows: \$60,000 per mile for 6-inch high pressure steel pipeline, \$40,000 per mile for 4-inch high pressure steel pipeline, \$30,000 per mile for 6-inch low pressure plastic pipeline, and \$20,000 per mile for 4-inch low pressure plastic pipeline. A temporary access road flat bladed with minor ditching and no culverts costs about \$700 per mile. The cost of a permanent access road is \$12,000 to \$15,000 per mile, depending on such factors as the number of culverts, the haul distance for surfacing material, and soil conditions. A single-phase power distribution line costs about \$7,000 per mile.

It is unlikely that facilities would have to be rerouted because of the scattered nature of the restricted areas and the location of the areas with respect to high activity oil and gas areas.

The cumulative effects of Alternative A on the lands and realty program would be beneficial in

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planning the use of communication and utility areas and improving management, but they would be adverse in requiring additional costs for grantees.

Designating corridors and planning communication site usage would have long-term beneficial effects because the use of those areas would concentrate environmental impacts along the corridors.

Surface ownership adjustments in Campbell County, which would be long term and irreversible, would benefit the federal government and the public.

Seasonal use restrictions could prevent the use of approximately 724,000 acres of federal surface at specified times of the year. However, it should be noted that the actual acreage is less because several restricted areas can overlap and because the requirements to protect areas from severe erosion hazard can be waived case by case.

Avoiding cultural sites on 69,720 acres and critical wildlife habitat on 8,080 acres would cause added expense in right-of-way construction over the longer routes necessary to go around those areas. Other financial impacts would be caused by protecting the soil from erosion, enhancing revegetation, and protecting visual resources.

Effects on Recreation

Timber harvest would disturb approximately 1,700 acres over the next ten years. Regeneration of clearcut sites to the point that they would again be desirable for recreation would take an estimated 15 to 20 years. Regeneration of partial-cut sites to the point of desirability for recreation would take from 5 to 10 years.

Because of the time required for regeneration, up to 2,400 acres could be in various stages of regeneration at one time. This figure includes harvest cuts conducted before those listed in the alternative. It can be assumed that at least twice this amount of acreage would be changed to the roaded natural setting.

Generally, the greater the amount of forestry activity in an area, the greater the amount of displacement, as recreationists attempt to avoid disrupted areas. The probability of impact occurrence is high because surface disturbance is an integral part of timber harvest. However, the overall effects of forest development on the recreation resource are not considered significant.

Forestry activities tend to shift the recreation opportunities in an area from semiprimitive to those that occur in roaded natural settings. The change brought about by added roads represents a long-term commitment to motorized recreational opportunities. Unroaded areas, a disappearing resource, make up only about 0.4% of the tri-county area.

On the other hand, the shift to a roaded natural setting is not very disruptive or apparent; therefore, it is of relatively little consequence. Most areas subject to forest development are little used at present because there is no public access. The introduction of haul roads into the area would do little to change this because limitations are placed on easements. Therefore, few people would observe any effect on the recreational setting.

The primary impact of grazing on recreation occurs in riparian zones. In some cases, heavy livestock use reduces the desirability of a site through overgrazing and wallowing to such an extent that recreationists may choose not to participate in an activity. The probability that it will occur is low because of the small acreage of riparian zones available for livestock use that would also be heavily used for recreation. Recreationists and livestock usually can coexist on the same site if use by either one is not too heavy. The impact of livestock grazing on recreation is considered insignificant in the resource area.

Disposal of public lands to which there is legal public access would have a potential long-term, irreversible adverse impact on recreation because it would preclude use that could otherwise occur



Courtesy of Wyoming Game and Fish Department

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on the land. This impact is considered highly probable because lands sales would result in private ownership and the termination of public use. The amount of land for disposal with public access is relatively small—approximately 300 acres. The sale of inaccessible lands should not affect recreational use.

The primary effect of coal development would be from the resulting population increase and the associated demand for recreational opportunities. The population of the tri-county resource area is projected to rise from approximately 56,100 in 1980 to roughly 103,400 by 1990 as a result of energy and minerals development. BLM-administered public lands in the area would absorb some of the additional use. The overall effect on the recreation resource administered by the BLM would be insignificant because public access is limited and there are few BLM-administered developed recreation sites.

Improved access resulting from road construction associated with mineral development create increased hunter harvest success and contribute to increased illegal game harvest. The ultimate long-term effect would be an increased number of hunter days required per harvest. This impact would be localized and is considered unlikely to occur given the dispersed occurrence of mineral development in the resource area.

Other recreation activities such as fishing, hiking, backpacking, picnicking, cross-country skiing, and snowmobiling might be affected by a disruption of the natural scene by oil and gas activities. Such effects would be considered minimal because the major concentrations of mineral development are on private surface. Most of the federal surface used for recreation is not in areas of mineral development.

Current planning does not provide for access into the WSAs. The effect of this is that enhancement of primitive recreation opportunities in the resource area is forgone. The current low level of visitation to the three areas (1,500 visitor days per year) will continue because access to the areas is controlled by owners of adjacent private land, who allow only limited public use.

The cumulative effects on recreational opportunities from Alternative A would be a slight degradation in quality and a slight reduction in diversity of recreational settings through timber development, grazing, and oil and gas activity. Coal development would result in the estimated doubling of recreation demand on public land.

EFFECTS ON MINERAL RESOURCES

Effects on Leasable Minerals

Effects on Coal

Site-specific effects related to coal mining are discussed in several EISs. Among these are the mining and reclamation plans for producing mines, the 1982 EIS, and the draft 1984 EIS prepared for the Powder River lease sales (USDI, BLM 1981b, 1984a). Site-specific impacts from individual new mines are not discussed here because locations of future mines are not known until a tract is delineated and sold. At that time, an EIS is prepared that deals specifically with the associated impacts of coal mining at that site.

Of the approximately 70 billion tons of federal coal available under this alternative for further consideration for leasing, exchange, and lease modifications, about 62 billion tons is uncommitted. This uncommitted reserve includes 12 billion tons of coal in PRLAs and delineated coal tracts. About 50 billion tons would be available for future coal leasing needs above the reserves in PRLAs and delineated coal tracts.

The likelihood of leasing this volume of coal is extremely low. A "worst case scenario" would involve leasing about 20 billion tons in the next ten years. This assumes that a lease sale would occur every two years and that two billion tons would be offered for sale. All coal mined and produced in the next ten years would be irreversibly and irretrievably lost.

Coal lands that would be available in this alternative would meet projected demand for federal coal far beyond the year 2,000, even if present production or demand should increase significantly.

The probability of leasing all the coal available in this alternative is extremely low. All the interest in future leasing and mining appears to be in Campbell County and in north-central Sheridan County, except for two PRLAs and two coal leases outside that area. However, that interest could change on the basis of demand, national policy, or new advances in coal development technologies.

Coal mining in northern Campbell County and in most of the developable coal deposits in Johnson and Sheridan counties would encounter

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a number of significant environmental problems and resource conflicts. Those problems are related to rougher break type country, steep slopes, soils subject to severe erosion, and a variety of wildlife and their related habitats. These include federal and state high interest species, rare or endangered raptors, and yearlong ranges for deer and antelope.

These areas are highly dissected by small drainages and several major streams. This increases the likelihood of affecting floodplains and alluvial valley floors. The probability that problems would be encountered in these areas is high. The probability that impact could be mitigated is moderate. Mitigation would increase reclamation costs significantly. Appendix 2 discusses areas unsuitable for mining and summarizes multiple use conflicts.

The scattered coal deposits in most of Sheridan and Johnson counties and in northern Campbell County, particularly in the Recluse area, would require construction of major transportation facilities. The probability of that occurring is high if coal leasing and mining occurs in those areas. The effects would be long term and the impacts would be adverse and unavoidable.

The probability for conflicts between coal production and oil and gas activity is high in northern Campbell County and along the west side of Campbell County, where oil and gas production is intensive. There are literally dozens of producing fields. Deferment of coal leasing in KGSSs would be beneficial in that one energy resource would not be developed to the detriment of another.

The rest of the coal, particularly the federal coal in Campbell County from about 20 miles north of Gillette and southward to the county line, is more easily developed because there would be few environmental problems. The terrain is flatter, reclamation potential is high, and there would be significantly fewer wildlife-related problems. The probability that impacts from mining in this area could be mitigated is high.

The intent of leasing oil and gas $\frac{1}{2}$ mile inside a coal lease boundary is to reduce the loss of federal oil and gas estates by peripheral drainage. However, the decision does not reflect the loss that could occur in the "no lease" areas. Many individual areas of the federal oil and gas estate inside coal leases are not contiguous to other federal oil and gas areas. For this reason, the probability of losing oil and gas is high because a well could be drilled on private surface and mineral within the coal lease. Any loss of oil and gas would be irreversible and irretrievable. Permit-

ting leasing of oil and gas reserves $\frac{1}{2}$ mile inside a coal lease boundary is beneficial because the potential for loss of federal oil and gas reserves is reduced.

Sale or exchange of public land that overlies developable federal coal might prohibit coal development because consent of the surface owner is required. There is a low probability that a surface owner who had met requirements as a "qualified surface owner" would not consent to surface mining.

Conversely, the decision would eliminate about 50% of the 5,000 acres available for sale and exchange in Campbell County. No opportunity is afforded to weigh development potential on the basis of interest or coal quantity and quality. There is a high probability that most of the land containing developable federal coal would not be included in a lease. Thus, entirely eliminating the opportunity to exchange or sell some of these lands is unreasonable.



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Effects on Oil and Gas

Table 4-1 shows the restrictions on oil and gas development that would apply under Alternative A.

The requirement for cultural surveys for well locations, access roads, and flow lines would involve expense. A typical survey for a well site and $\frac{1}{2}$ mile of access road would cost approximately \$500. If one or more significant sites should be discovered and if a road or flow line must be rerouted or a drilling location moved, additional costs would be incurred. This expense would be approximately \$300 for each archeological survey. These costs represent approximately 0.001% of the total cost of developing a well; thus, they would be an adverse short-term impact for the grantee.

Securing an archeological clearance for the initial well pad or route is always required; however, the probability for additional expenses to relocate the proposed activities is less than 10% if a 40-acre survey is conducted.

The requirement that 600 acres of R&PP land in Sheridan and Gillette not be occupied during oil and gas exploration and development would be a short-term adverse impact. The impact would occur only if a lessee should determine that directional drilling techniques are required to drain the reserves adequately. In that case, an additional 25% to 50% cost could be added to the cost of approximately \$500,000 to drill a conventional well. Because of the small acreage involved and the locations of the R&PP areas, this impact is unlikely to occur.

Sales or exchanges of scattered public land parcels in Campbell County without consideration of oil and gas exploration and development would have an unavoidable long-term effect on oil and gas development. There is a high probability that added expenses would be incurred in the form of surface damage fees charged by the new surface owners. These fees would vary, but they could be as much as those listed below.

Temporary road to drill the well: approximately \$6 per rod

Rental for a road if the well is productive: approximately \$3 per rod

Three acres on which to construct a drill location: approximately \$5,000

Rental for a producing well location: approximately \$750 per year

Rental for each tank battery: approximately \$750 per year

Initial payment for construction of a pipeline: approximately \$6 per rod

These expenses may be partially offset by not requiring a Class III archeological survey or a plan of operation on private surface.

On the other hand, there are no rental charges to the oil and gas companies for surface use of public lands that are either on lease or within a production unit.

The oil and gas reserve is available for leasing on approximately 99% of the mineral estate in the resource area. Provisions are available to lease all of the remaining federal mineral estate except approximately 800 acres underlying incorporated cities and towns, which would not be available. On the basis of industry interest and open oil and gas filings received, it is estimated that the probability of leasing oil and gas in the entire resource area is high.

Decisions in the recreation and VRM program would prohibit surface occupancy for oil and gas development on approximately 107,000 acres. This is unlikely because of the location of the recreation and VRM areas involved in relation to the areas in which oil and gas operations are generally concentrated. Generally speaking, this adverse impact on oil and gas development would be minor because the areas generally do not overlap and could be drained by conventional drilling.

Some leases can be developed only by directional drilling because of requirements that the land surface not be occupied. Such leases are not issued unless the lessee/operator so requests. If such a lease was issued, the operator would incur additional expenses over the cost of conventional drilling (25 to 50% more if the subsurface structure is compatible and there are no drilling problems).

The cost of drilling a conventional well and pipe would be approximately \$500,000 for a well 8,500 feet deep. The added cost would be an unavoidable adverse impact, but it would be optional to the lessee/company in all cases.

The visual resource requirement that all permanent facilities must be camouflaged would cause a short-term adverse impact on oil and gas operations. There would be an added expense of approximately \$3,000 per new well site unless the equipment received by the operator was repainted to the correct color, in which case there would be no additional cost. If camouflage painting was done on a regular maintenance painting schedule, there would be no additional cost. The probability of extra expense being incurred is low to moderate.

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TABLE 4-1
RESTRICTIONS ON OIL AND GAS UNDER ALTERNATIVE A

<u>Federal Minerals That Would Not Be Leased for Oil and Gas</u>	<u>Acreage</u>	<u>Subtotals (acreage)</u>	<u>Total Acreage</u>
Wilderness study areas		29,000	
Incorporated cities and towns		800	
Buffalo Resource Area planning (de facto no lease areas)*			
Red Wall	200		
Middle Fork Canyon	4,000		
Fortification Creek area	2,600		
Total de facto no lease acreage		6,800	
*These "no lease" areas are created by assuming no oil and gas would be drained from areas beyond the 1/2-mile "no surface occupancy" area.			
Total "No Lease" acreage		36,600	
<u>Areas With Year Round "No Surface Occupancy" Provisions</u>			
Wildlife			
Elk calving grounds in Fortification Creek area ^a	4,900		
Big game winter ranges ^a	27,000		
Sage grouse leks ^a	3,500		
Sharp-tailed grouse leks ^a	200		
Eagle winter roosts ^a	300		
Wildlife subtotal		35,900	
Areas With Slopes of More Than 25%			
Cultural sites		266,000	
Visual features		69,720	
Red Wall	7,000		
Middle Fork Canyon	8,200		
Dry Creek Petrified Tree	40		
Visual subtotal		15,240	
North Middle Pumpkin Butte and South Middle Pumpkin Butte		1,000	
Streams, reservoirs, and wells		19,000	
County, state, and federal highways; railroads		91,000	
Gillette RAPP area	40		
Sheridan RAPP area	360		
RAPP subtotal		600	
Coal leases with mining pit development plans		16,000	
Year-Round "No surface occupancy" total			514,460
<u>Areas With Seasonal "No Surface Occupancy" Provisions</u>			
Wildlife			
Bighorn sheep winter range ^a (11/3 - 4/30)	106,000		
Elk and bighorn sheep calving areas in			
South Big Horns ^a (5/1 - 6/30)	9,000		
Sage grouse nesting areas ^a (3/1 - 6/15)	170,000		
Sharp-tailed grouse nesting areas ^a (4/1 - 6/1)	3,000		
Raptor nests ^a (3/1 - 6/30)	100,000		
Eagle winter roosts ^a (11/1 - 3/30)	1,700		
Wildlife subtotal		389,700	
Severe erosion hazard (3/1 - 6/15)		1,767,000	
Seasonal "no surface occupancy" total			2,156,700

NOTE: Some restrictions contain provisions permitting a waiver by the authorized officer if the restriction does not apply in a particular case. In some cases, two or more restrictions may overlap on one area. Most acreage figures are approximate.

a. Acreage figures concerning wildlife populations are estimates. Wildlife populations fluctuate and restrictions on surface-disturbing activities may increase or decrease accordingly.

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The requirement that there be no surface disturbance on slopes of more than 25% for oil and gas development would have a long-term minor adverse effect on oil and gas development on about 9% of the resource area (266,000 acres). In some cases this would prevent oil and gas exploration and development at the desired location. However, to date the number of conflicts between the restriction and proposed drilling operations has been insignificant. The restriction is unlikely to be applied at the time of drilling.

When a lease contains the restriction, exploration can be done in the area that contains slopes of 25%, but in locations where the terrain is less steep. In this way, operators can determine if there are reserves present without exploring the steeper terrain. Acceptable locations on isolated areas with slopes of less than 25% usually can be found within the steeper areas.

Most areas with the 25% slope restriction are scattered and small and could be drained by conventional drilling from outside the restricted areas. The discussion of directional drilling in areas restricted by VRM decisions also applies to areas with slope restrictions.

Added costs for construction of access roads and well pads could be incurred by oil and gas operators because of seasonal prohibition of surface activity to protect susceptible soil from erosion. About 1,767,000 acres (58% of the resource area) would be affected by such restrictions under Alternative A. These restrictions also could upset the drilling schedule of some lessees. If the companies had to drill in winter, removing snow and breaking up the frozen ground could add \$3,000 to \$6,000, or as much as \$10,000, to the cost of constructing a well pad and access road that could be constructed during less severe weather for approximately \$12,000 to \$15,000. This would be an unavoidable adverse impact. The probability that this would happen is low.

Prohibition of surface occupancy for oil and gas activities to protect crucial wildlife habitat would have a long-term adverse effect on oil and gas operations. Approximately 36,000 acres of federal mineral estate, or approximately 1% of the resource area, would be involved. In some cases oil and gas exploration and development could not be carried out at the location the lessee/operator prefers.

Conflicts between wildlife restrictions and proposed drilling operations have been few. It is unlikely that the restrictions would be applied at the time of drilling. The "no disturbance" areas are small and generally widely scattered, and

some areas are located away from the oil and gas concentrations. Most such areas are small and could be drained by conventional drilling outside the "no surface disturbance" areas. Thus, the probability of not developing oil and gas reserves on these areas is unlikely. The discussion on leases requiring directional drilling applies to these restricted areas.

Prohibition of surface occupancy for oil and gas activity during specified times of year to protect wildlife would have an adverse effect on oil and gas operations. The restrictions apply to approximately 390,000 acres of federal mineral estate, or approximately 13% of the federal mineral area in the resource area. Costs could be added to construction of access roads and well pads, and the drilling schedules of some lessees could be changed.

If this restriction caused the companies to drill in winter, the effects on operators would be similar to those described in connection with seasonal restrictions to prevent soil erosion. This adverse impact would be unlikely to happen because of the small number of seasonal restrictions that actually cause winter drilling.

The unavailability of approximately 29,000 acres in the WSAs for leasing of oil and gas could lead to drainage of federally reserved oil and gas resources by wells on or adjoining state or privately owned minerals. Assuming federal reserves could be drained by wells on private minerals within $\frac{1}{2}$ mile, drainage potential exists on the following approximate acreages: 2,800 acres in Fortification Creek, 7,000 acres in Gardner Mountain, and 2,600 acres in North Fork. This would be an irretrievable long-term adverse impact.

The cumulative effects of Alternative A on oil and gas would be added expense to oil and gas operators because of various restrictions on surface disturbance and seasonal restrictions.

Oil and gas operators could be unable to occupy the exact site desired for drilling by approximately 514,000 acres of cultural sites, R&PP sites, areas with slopes of more than 25%, and coal mining areas. This would be a short-term unavoidable adverse impact unless a subsurface formation should be present that would not be conducive to drainage in this manner.

Seasonal restrictions for protection of wildlife habitat and areas of severe erosion hazard could prevent the surface use of approximately 2,158,700 acres during specified times of the year. This could cause added expense to the oil and gas operators because they might be required to

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conduct construction and drilling operations during the winter. Other financial impacts would be caused by avoiding cultural sites, protecting the soil from erosion, and selling or exchanging lands without considering oil and gas exploration and development.

Effects on Salable Minerals

Coal mining operations use approximately 150,000 tons of federal scoria per year to surface roads and areas around plant facilities. This scoria generally is removed as coal mine overburden. Oil and gas operations use approximately 5,000 tons of scoria from federal reserves per year for surfacing access roads and areas around production facilities, as well as an undetermined amount of private material. County and state highway departments use approximately 280,000 tons of federally reserved sand and gravel and scoria per year for use in surfacing federal, state, and county roads. These uses represent a long-term, irreversible commitment of resources. There is a high probability that this use will continue.

The cumulative effects of Alternative A on salable minerals would be the continued use of approximately 435,000 tons of salable minerals that are used each year for coal mine development, oil and gas development, and county, state, and federal highway surfacing. This would be a long-term, beneficial effect.

EFFECTS ON SOIL RESOURCES

Effects on Soils

Fire control measures such as firelines create drainage ways that concentrate and increase the velocity of water so that soil erosion increases. Surface disturbance associated with fire control can be mitigated by such practices as water barring and reseeding. There generally will be a short-term soil loss before fire lines are revegetated. It is estimated that less than 10 acres per year would be affected.

Prescription burning in forestlands to eradicate slash in sale areas would result in some soil loss. The amount is not easily quantified because of several variables such as slope, aspect, and fire intensity. Vegetation probably would be reestablished within one to three years, but some soil loss would occur in the short term. The loss

would not be significant, nor would long-term productivity of a site be decreased.

Commercial timber harvest on 1,700 acres would result in soil compaction and some erosion. However, erosion and compaction can be minimized by ripping, water barring, reseeding, and closing roads and skid trails.

The potential is high for wind and water erosion of soil on about 161,000 acres of rangeland in fair or poor condition. In some specific sites, most notably sites in the Powder River breaks, livestock grazing contributes to erosion; however, the principal causative factor is the shallow, sparsely vegetated soils.

Livestock concentrations would cause long-term disturbance of soils, including compaction and removal of ground cover, on 10 to 15 acres in the immediate vicinity of 30 water facilities. The probability that this impact will occur is high.

About 285 acres per year would be disturbed by various rights-of-way in the resource area. No significant impact on soil is expected from construction of power lines and telephone lines after the construction is finished. Pipeline rights-of-way would cause short-term moderate impacts consisting of compaction and mixing of soil layers.



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Roads, especially unsurfaced roads such as those serving oil wells or other structures, are the largest contributor to soil loss. Roads are generally long lasting. Soil compaction, mixing, road use, weather, and runoff can result at times in severe site-specific movement of soil. The probability that this will occur is high, but the effects normally would be short term and insignificant compared to the total soil loss in the resource area.

Soils would be mixed and compacted on about 300 acres where mineral material would be extracted in the next ten years. In general, soil productivity could be reduced by 15 to 20% in the long term on reclaimed sites where mineral material is mined. Mineral material sites are characterized by shallow soils, which are extremely sensitive to disturbance. Soil loss from erosion is not significant.

Oil and gas exploration and drilling would result in mixing of soil structure and compaction on about 12,000 acres in ten years. About 8,000 acres would be on private surface over federal minerals. About 60% of this land would be reclaimed annually; thus, impacts would be short term on those areas. In general, most well sites are successfully reclaimed. However, on the 40% of the acreage involved in the operation of producing wells, the impact on soil would be long term. Soil compaction, oil spills, and the use of chemical fluids to induce well flows probably would occur, and soil productivity would be reduced. This would be an unavoidable adverse impact.

It is highly probable that decisions regarding development of minerals would reduce soil erosion resulting from surface-disturbing activities. These decisions specifically deal with mechanical treatments of the soil, saving and protecting the quality of the topsoil, restriction of developments on steep slopes, addition of supplements to enhance soil fertility, and reestablishment of vegetation.

The development of federal coal would result in the removal of topsoil. Impacts to subsoils (for example, argillitic horizons) could occur in the form of destruction of the soils' structure, which may take thousands of years to develop. Destruction of these soil aggregates (also referred to as peds) could be expected to decrease rates of permeability and infiltration and to decrease air exchange and available water holding capacity.

In arid climates, soil structure and bulk density are very important to soil properties affecting the moisture regime of soils.

Dilution of the solum by less fertile substratum material would result in a decrease in the fertility

of the soil. The substratum horizons typically contain significant accumulations of calcium carbonate and sometimes soluble salts, which are detrimental to seed germination and water uptake by plant roots. Substratum material also is very low in organic matter, microbial activity, and major plant nutrients, and it has poor structure or physical properties.

Wheeled vehicles cause soil erosion by disturbing the vegetation and causing soil compaction. ORV restrictions on approximately 492,000 acres have a high probability of reducing such damage. Much of the restricted acreage is unlikely to be used by ORVs.

Establishment of protective zones along drainages in the Middle Fork probably would reduce soil compaction and sloughing of stream banks and generally reduce soil degradation and erosion in riparian areas. Decisions to improve general ground cover by 50% along controlled portions of streams probably would benefit soil stability and decrease soil erosion in these riparian areas.

The cumulative effects of Alternative A on soils would be a minor effect from wildfires, moderate short-term erosion on about 1,700 acres where timber would be harvested, short-term disturbance of about 2,800 acres over ten years by right-of-way development, and disturbance of 300 acres over ten years by extraction of salable minerals. Soils would be disturbed over the long term on 10 to 15 acres near livestock water developments, and permanent roads would have a long-term adverse effect on 200 acres. About 12,000 acres would be disturbed in ten years by oil and gas exploration and drilling; of this, 60% would be reclaimed in the short term and 40% would be affected for the long term.

Effects on Topography

The only effects on topography will result from mining of coal and mineral materials, and those effects would be minor. After the areas are reclaimed, the topographic profile would be virtually the same as the original landscape in most areas, but not in areas of rugged hills and steep-walled drainages. Although the elevation of the reclaimed mine areas would be approximately the same in the short term, it would continue to settle and would be slightly lower in the long term. This would be an irreversible impact. There would be no unavoidable adverse impacts. The probability of the above impacts taking place is high.

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EFFECTS ON VEGETATION RESOURCES

Commercial timber harvest from approximately 1,700 acres—1,200 acres by partial cut and 500 acres by clearcut—would result in partial or complete removal of the overstory and localized disturbance of the understory. Herbaceous vegetation and tree seedlings normally would become reestablished within three years after initial disturbance.

Construction of range improvements would result in removal of vegetation on 250 acres, and noxious weed spraying on 1,500 acres would alter plant community structures on 1,750 acres. Vegetation would become reestablished on disturbed areas within three years.

Right-of-way construction would remove approximately 2,850 acres of vegetation over the next ten years. Approximately 1,350 acres would be revegetated within three years. The remaining 1,500 acres would remain unvegetated because roads and other permanent facilities would replace the vegetation.

Coal mining would remove approximately 18,000 acres of vegetation. Disturbed sites normally

would be revegetated within ten years from initial disturbance. Approximately 800 acres of ponderosa pine/shortgrass prairie vegetation in the coal mining areas would be disturbed and might not be reclaimable, particularly on locations where the subsurface formations have allowed roots of trees and shrubs to penetrate and use the available moisture. Reclamation efforts might not be able to re-create the original condition; therefore, ponderosa pine and associated understory vegetation might be irretrievably lost.

The success of revegetation (reclamation) of the plant communities to perpetuate themselves under the indigenous environmental conditions of an area, such as moisture distribution during the growing season, wind, temperature extremes, and drought. It also depends on the ability of the reclaimed land to meet postmining land use objectives. The following are the primary points of concern relevant to reclamation.

Reestablishment of any type of vegetation

Reestablishment of forbs, shrubs, and trees

Reestablishment of diverse native plant communities

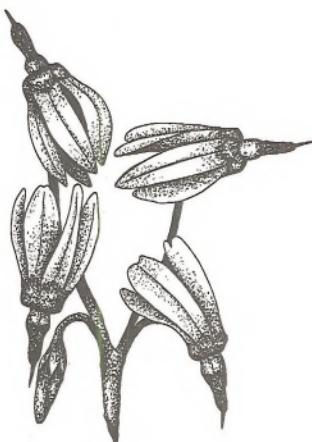
Topographic and landscape alterations with respect to vegetative reclamation

Sufficient soil moisture to ensure plant growth at critical times is the major limiting factor influencing plant growth in the Northern Great Plains. The shape of land surface, or topography, controls water movement and influences ground moisture. Surface mining normally smooths the landscape and eliminates rugged, diverse topography. Because replacement and recontouring of spoils affect the success of revegetation, careful design of spoils replacement is recommended.

As a rule, successful reclamation of land disturbed by coal mining depends on the total investment in reclamation rather than on physical factors. Successful reclamation can be accomplished provided funding is adequate. Some mines in the Powder River region at which vegetative cover has been successfully established are the Black Thunder, Belle Ayr, Eagle Butte, Big Horn, Dave Johnston, Decker, and Rosebud. The first four are in the Buffalo Resource Area.

Mining of mineral materials would remove approximately 300 acres of vegetation. Disturbed sites would normally be revegetated within three years.

Oil and gas exploration and development would remove approximately 12,000 acres of vegetation (8,000 acres of private surface, 4,000 acres of



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BLM-managed land). Approximately 8,000 acres would be revegetated within three years. The remaining 4,000 acres would remain unvegetated because producing well sites would occupy the surface. Sites would eventually be revegetated after the oil and gas resources were depleted (20 to 25 years).

Off-road vehicle use would disturb approximately 200 acres of vegetation during the next ten years. Most disturbed areas would recover within three years. Approximately 50 acres might remain unvegetated in the long term because the same ORV trails would be subjected to repeated use.

The cumulative effects of Alternative A on vegetation would be the unavoidable short-term removal or disturbance of approximately 36,800 acres of vegetation over the ten-year life of the plan as a result of coal development (18,000 acres), oil and gas exploration and development (12,000 acres), right-of-way construction (2,850 acres), timber harvesting (1,700 acres), noxious weed spraying (1,500 acres), mineral material sales (300 acres), range improvement projects (250 acres), and ORV use (200 acres).

In the long term, approximately 5,500 acres would remain unvegetated as a result of roads, producing wells sites, and other permanent facilities.

The only irretrievable or irreversible impact on vegetation that might occur would result from coal mining, which would disturb approximately 800 acres of the ponderosa pine/shortgrass prairie vegetative type during the next ten years. Reclamation efforts might not succeed; therefore, the ponderosa pine and associated understory vegetation could be irretrievably lost.

EFFECTS ON VISUAL RESOURCES

The harvest of trees on 1,700 acres of commercial forest and woodlands would have moderate long-term effects on the visual resource by reducing the visual classification of the area. Significant degradation of the visual resource in clearcut areas (1,200 acres) would be evident for 15 to 20 years. Visual degradation in woodlands and partial cut areas (500 acres) would be somewhat less significant and would last for five to 10 years.

Visual degradation would be reduced on most sites by mitigative measures normally applied to timber harvest contracts, such as screening,

feathering of boundaries, and selective cutting. The visual impacts of timber harvesting would be neither irreversible nor irretrievable; however, the adverse effects would be unavoidable. Because of the removal of trees and the ground disturbance integral to timber harvesting, there is a high probability of some degree of impact on the visual resource.

Construction of roads and pipelines would cause short-term moderate degradation of the visual resource, pending successful reclamation. Some residual long-term minor visual impacts also would be expected to be associated with these surface disturbances. Permanent structures erected along the roads would cause a long-term impairment of the visual resource.

Depending on the size and location of the project, most actions under the lands program can be designed in accordance with VRM objectives. The visual impacts on an estimated 285 acres per year disturbed for rights-of-way would be largely reversible and retrievable. Most of the resource area is rated as Class III and IV, the significance of these impacts would be low. The probability of this impact occurring is high because of the terrain and the number and size of these projects.

Most corridors are based on existing transportation networks such as major highway systems. The VRM rating of most of the area is Class III. Corridors increase the visual impact in some cases. This is true of the power line between Interstate 25 and the Big Horn Mountains, which are the major visual element in the resource area. The major viewshed from I-25 is toward the Big Horns, and the corridor should be on the opposite side of the highway. However, the costs that would be incurred in moving the power line would make correction of this corridor uneconomical.

Surface mining of coal would result in the change of the form, line, color, and texture of the affected landscape. Permanent long-term structures such as silos, power lines, and railroads would change the texture and line of the landscape, causing an irretrievable and irreversible loss of natural lines and forms of the existing landscape. Approximately 1,800 acres per year would be affected, and the effect would be moderately significant to visual resources in the immediate area. The average lifespan of a mine is 30 to 40 years.

This impact is considered highly probable because of large-scale development of surface coal mining.

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Construction of oil and gas exploration and development sites would cause moderate degradation to the visual resource. The impact of wells quickly abandoned and rehabilitated is short term, while impacts from producing wells could be expected to last up to 30 years. Some residual long-term visual scars also could be expected. Mitigative measures normally applied to development permits limit visual impacts.

Most of the impacts resulting from oil and gas development on an estimated 12,000 acres over the life of the plan (including both public and private surface overlying public mineral estate) would be unavoidable and adverse. Because of the dispersed nature of these disturbances, the impact on the visual resource would be only moderately significant since most of the affected lands are in the Class III and IV visual categories.

Most locations have moderate slopes and sagebrush/grassland type vegetation. Significant impacts would result from development in steep terrain and in brush and timber where site layout and reclamation would be more limited. The probability of visual degradation is high because of the number and location of these projects.

"Wildcat" wells usually cause more impacts because they are in undisturbed areas. The greatest impacts from oil and gas activities result from wildcat wells in highly visible areas that do not

contain other intrusions of this type. This is especially true in areas where brush and trees must be cleared. A somewhat lesser impact results from wells in developed fields where intrusions of the same type exist or in areas that are not highly visible.

Lack of ORV designations in Sheridan and Campbell counties would result in small isolated short-term reduction in visual quality from ORV damage to approximately 20 acres per year of vegetation and 10 acres per year of soils. This impact is considered highly probable on lands with public access because of the high demand for pleasure driving, but it would be minor within the resource area because of small amount of public access available.

Visual resources within the WSAs generally would remain unchanged. There is a high probability that little visual change would occur in the WSAs.

The cumulative effects of Alternative A on visual resources would be degradation from development of oil and gas, coal, and rights-of-way, with lesser effects from timber harvesting and grazing.

Continuation of current resource management practices would have little overall effect on visual resources in the area because most of the resource area is rated as Class III and IV.



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EFFECTS ON WATER RESOURCES

Full suppression of all fires occurring in the resource area would decrease the amount of area burned, which in turn would reduce the amount of sedimentation that would potentially reach water sources.

Water yield would increase from 5 to 15% on 1,700 acres of timber harvest areas. This increase would decline to preharvest levels over approximately 30 years, or the length of time needed for the vegetation canopy to return to preharvest density. Sedimentation in water sources would be expected to increase in the short term. After reestablishment of ground cover, which usually takes one to three years, the sediment yield should decline. Peak stream flows would increase on small, lower order streams for one to three years.

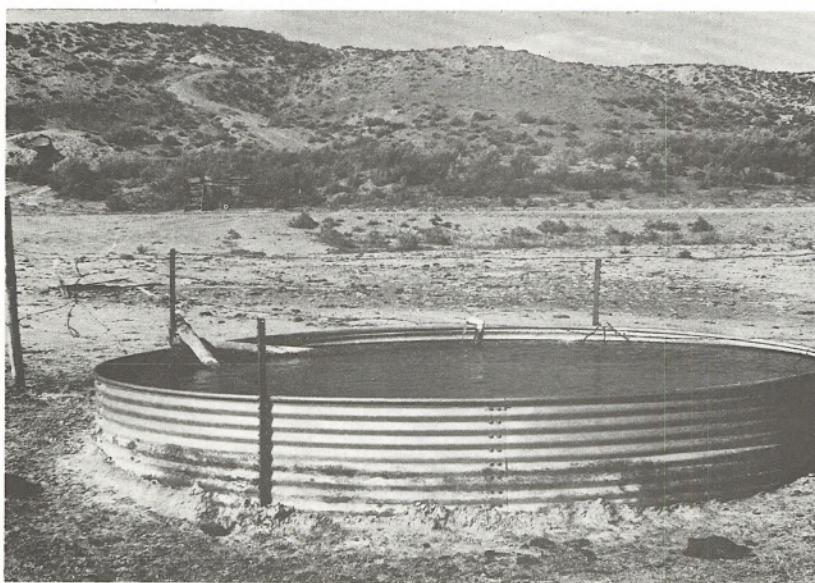
Sedimentation of water sources, reservoirs, and springs from grazing would remain static in

most of the resource area. Sedimentation cannot be quantified with existing information, but livestock concentrations would continue to result in sedimentation of water sources.

Sedimentation probably would increase on about 4 miles of riparian habitat on the public lands. These areas are characterized by poor riparian vegetation resulting from livestock grazing. The probability of accelerated erosion occurring in these areas is high in the long term; therefore, water quality in these streams would decrease in the long term. The effects could be prevented through measures such as selective fencing.

Disturbance of about 285 acres per year by various permitted rights-of-way would increase sedimentation and decrease water quality in localized areas. The sedimentation would last for one to three years, or until successful reclamation was completed. The effect is unlikely to occur because most rights-of-way are routed away from live water.

Ruptures in petroleum pipelines would cause significant adverse effects if the fluid should



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reach a water source. A rupture is unlikely to occur, and the probability of fluid reaching water depends on the time needed to stop the flow on the surface and on the distance to water. In the worst case, pipeline breaks or leaks could result in water contamination.

Effects on groundwater would occur primarily within a 2- to 3-mile radius of mined areas. Mining would have little effect on regional groundwater systems. Impacts would include removal or modification of aquifers, interruption of groundwater flow during mining, modification of flow after reclamation, and changes in water quality.

New mining of federal coal would result in the removal of the lowest coal aquifer mined and all aquifers above it. Coal beds usually are the most extensive shallow aquifers in the region, whereas sandstone aquifers in the overburden and interburden usually are lenticular beds of relatively small areal extent (USDI, BLM 1984a).

The change in the water level surrounding the mine would depend on the aquifer characteristics, recharge rates, and pumping rates. The decline would be greatest in the mine itself; it would decrease with distance from the mine edges to negligible amounts within a few miles.

Modification of groundwater flow after reclamation results from breakup of the layering that generally occurs in native formations of the region and from modification of the slope of the land surface. In many parts of the region, relatively impermeable shale layers interbedded with sandstone and coal cause perched zones of saturation to form. Where perching layers outcrop, springs or seeps occur. The replaced spoil is relatively uniform in composition, so that vertical and horizontal permeability are similar. For this reason, in reclaimed area there are no perched zones with their springs and seeps, and recharge to the water table is increased.

The removal of springs and seeps from their former locations would affect the plants and animals that depend on the additional water at those locations. Springs and seeps might reappear at different locations after the completion of reclamation, or the extra recharge to the water table might discharge into streams. The overall impact of mining would be a permanent change in groundwater flow, but mining would not permanently diminish the quantity of water available in the area of the mine.

The water in the spoil aquifer would be of poorer quality than the water in the original aquifers. This is because the disturbed spoil

presents many fresh surfaces to percolating water and this causes solution of soluble minerals to occur at a higher rate. The solution rate would eventually return to normal levels; however, with the low levels of precipitation and recharge prevalent in the Powder River Region, this process might take many years, perhaps centuries. Contamination of groundwater in spoil aquifers can be mitigated by requiring selective placement of saline spoil above the zone of saturation (USDI, BLM 1984a).

Surface outflow from the Powder River Region will be reduced by about 3,113 acre-feet per year by projected coal mining if no new leasing takes place. New mining could cause the surface outflow to be reduced by an additional amount of 303 to 1,085 acre-feet per year. Estimates of the reduction in surface outflow are less than projected increases in water use because much of the water intercepted and consumed by mining would otherwise be dissipated by evaporation losses on site or en route downstream. Flow reductions would be too small to have an adverse effect on beneficial uses or aquatic biology of perennial streams (USDI, BLM 1984a).

Several livestock ponds and small reservoirs would be destroyed by mining. Although the quantity of water lost would not be regionally significant, the loss of water sources would be a deterrent to use of the area by wildlife and livestock until the sources were replaced during reclamation. However, since only a fraction of the total leased area would be undergoing mining at any one time, only a fraction of the affected reservoirs would be unavailable for use at any one time (USDI, BLM 1984a).

Discharge from coal spoils aquifers might contain TDS concentration two to three times greater than those in undisturbed aquifers. This water could be marginal for use by livestock and wildlife. Most of the discharge from spoils aquifers would occur as small springs and seeps in ephemeral stream channels, which would delay and reduce the effect on that discharge on the quality of water in perennial streams.

If no new leasing occurs, the dissolved load of streams in the region will increase as existing mines disturb additional acreage and as projected mines are developed. The effect of new and proposed mines (without additional leasing) would be to increase TDS concentrations as much as 5.6% in the Cheyenne River, the most heavily affected drainage (USDI, BLM 1984a).

Surface disturbance from oil and gas development would result in sedimentation and a reduction

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In water quality at specific sites. Impacts could occur from pit ruptures (which are unlikely), leaks, the use of chemicals on site, and sedimentation from access roads and drill pads.

Irreversible damage to groundwater could result from improperly plugged drill or shot holes, improper cementing of aquifers, or fracturing. The magnitude of the problem is not known because no studies are known to have been done in the resource area.

EFFECTS ON WILDERNESS

The use of mechanical equipment in full fire suppression activities within the WSAs would have a high probability of affecting the naturalness of the areas. Whether this type of equipment would be used would depend on fire size and intensity. Small fires might result in the cutting of a small number of trees and in some soil disturbance. Suppression of large fires might involve some construction of firelines and roads, timber cutting, and use of mechanical equipment. This could have long-term effects on naturalness.

ORV designations would apply to all portions of the WSAs that lie in Johnson County. Parts of Fortification Creek would not be covered by ORV designations; therefore, ORV use might cause some minor resource damage to soil and vegetation. There is a moderate probability that this impact would occur because of the high demand for opportunities for pleasure driving.

Wilderness characteristics would not be affected by oil and gas exploration and development because such activities would adhere to the nonimpairment criteria. The WSAs in the Buffalo Resource Area do not contain any pre-FLPMA leases (which would not be subject to the nonimpairment criteria).

EFFECTS ON WILDLIFE RESOURCES

Logging of 170 acres per year in the south Big Horns would have a long-term adverse impact on elk because the sale areas or adjacent forestlands would not provide sufficient hiding and thermal cover. There is a moderate probability that the elk that occupy proposed sale areas would be displaced until regeneration could provide sufficient

cover for them to return. The probability for a long-term decrease in elk numbers is low.

Elk would be adversely affected in the short term by loss of cover within 1/2 mile of access roads to timber sale areas in the Big Horns. This impact has been established through scientific studies (Ward 1976). The impact would be substantially reduced if the road was closed to the public after the sale because elk would be reestablished after the road was closed.

Potential wildlife and livestock conflicts and competition for forage would continue over the long term on 10,000 acres of crucial winter range for elk in the south Big Horns. The probability of such impacts occurring is moderate. The ultimate effect would be a long-term reduction in elk numbers.

The populations of mule deer, antelope, and elk on 23 "I" allotments would remain the same under this alternative. The present totals on the 23 allotments of 11,770 mule deer, 2,800 elk, and 3,500 antelope do not meet the WGFD strategic plan objectives of 13,700 mule deer, 3,000 elk, and 3,920 antelope.

Four miles of riparian habitat would remain in unsatisfactory condition, and the condition of unquantified additional acreage along streams and wetland areas could decline because of continued livestock concentrations in these areas. This would result in a loss of riparian habitat and stream productivity. There is a moderate probability of such impacts occurring.

Disturbance of crucial wildlife areas such as elk winter range and sage grouse strutting grounds would be prevented under this alternative by existing decisions regulating transportation corridors and restricting rights-of-way. This would provide a long-term benefit to these species. Within the Fortification Creek area, further decisions to pipe oil and gas production out of elk winter range and to bury power lines would have a long-term high probability of reducing vehicle traffic and the amount of human disturbance to elk and mule deer.

"Blocking up" federal surface by exchange in Campbell County would be a long-term benefit to wildlife habitat because the land would be consolidated into manageable units, facilitating hunter access. The WGFD would have better control of big game populations. The probability of such impacts occurring would be high.

Disturbance of 20 to 30 acres each year by mining of sand, gravel, and scoria and by road

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construction would have a short-term insignificant adverse impact of habitat removal.

Seismographic exploration would continue to have a short-term minimal impact on approximately 1,000 acres of wildlife habitat yearly. Wildlife would be displaced temporarily and a small amount of habitat would be lost until roads and drill holes could be reclaimed.

Oil and gas exploration and development would disturb 1,500 to 2,000 acres of habitat (350 acres BLM surface) each year. Of this disturbance, approximately 40% would be long term. These impacts include habitat loss and, to a lesser degree, displacement of wildlife from activity concentration areas. The probability of such impacts occurring is moderate.

The major impacts from coal mining on big game would occur to antelope in the Highlight herd unit and to antelope, mule deer, and white-tailed deer in the Youngs Creek area. These impacts would include impediment of daily and seasonal movements by right-of-way fences and rail spurs. There also would be impacts from road kills, poaching, and habitat loss.

The total habitat disturbance from development of the Wyoming tracts would amount to 3% of the Highlight antelope herd unit and 2% of antelope hunt area 15. Adverse impacts from development could cause a maximum net loss of 385 antelope in the Highlight herd unit and 60 in area 15.

The worst adverse effect on mule deer would occur in the Youngs Creek tract, where destruction of riparian vegetation and of the rocky hillside north of Youngs Creek to the Montana state line would cause loss of cover. The rocky hills along the Belle Fourche River in the Mount Logan tract would be removed, and the topography would be smoother after reclamation. This would permanently lower the value of the area as winter habitat for mule deer, causing an irreversible and irretrievable adverse impact.

Development of the Hidden Water tract would adversely affect mule deer because upland cover, in the form of juniper and groves of ponderosa pine, would be removed. Removal of rock outcrops and rock piles would cause loss of topographic cover, and the reclaimed topography would be smoother and less suitable for deer cover. Trees planted on the reclaimed surface would take 15 to 25 years to grow large enough to provide escape and thermal cover. Overall, the carrying capacity for mule deer would be significantly lower for 20 years or more after mining ended. However, in the long term the carrying capacity for mule deer

would be only slightly lower than it was before mining (USDI, BLM 1984a).

Two sharp-tailed grouse leks would be destroyed by mining of the Hidden Water tract. The birds probably would be displaced to adjacent unoccupied territory, assuming it would be available. Proper reclamation probably would make the tract suitable for sharp-tailed grouse after mining ended.

One sage grouse lek and nesting area on the Mount Logan tract would be destroyed, and parts of the nesting areas around two other leks also would be mined. This would have moderately negative impacts on the sage grouse population in southeastern Campbell County.



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Mining would destroy a few small black-tailed prairie dog towns on the Hidden Water and Porcupine tracts. U. S. Fish and Wildlife Service personnel surveyed the towns in 1982 but found no sign of black-footed ferrets. Destruction of these towns would have a minor impact, causing the loss of a small portion of potential ferret habitat. The towns would have to be surveyed immediately before ground disturbance began to ensure protection of the ferret (USDI, BLM 1984a).

Bald eagles occasionally use some of the tracts for foraging in the winter. No adverse effect on the eagles would be expected. There would be some loss of hunting habitat for eagles near the Kintz Creek and Hidden Water tracts.

Elk winter range and calving areas in the south Big Horns and WGFD big game winter ranges would not be adequately protected from the impacts of oil and gas development. This would cause a long-term negative effect on big game from oil and gas development. Impacts would include loss of habitat, displacement of big game away from activity concentration areas and access roads, increased physiological stress, and the resultant decline in herd health and reproduction. If development occurs, the probability of such impacts occurring is high. However, no development is occurring now and none is foreseen; therefore, the results would be insignificant.

Past experience indicates that restricting ORV use on approximately 27,000 acres of crucial big

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game winter range would have a long-term beneficial effect in preventing damage to the habitat and displacement of big game from these crucial areas. This is unlikely to occur.

Prohibition of surface-disturbing activity within 500 feet of surface water to control erosion would have a long-term beneficial effect on riparian and wetland areas by preventing loss of wetland and riparian vegetation, bank sloughing and siltation, and possible contamination of water. The likelihood of this occurring is estimated to be low.

Prohibition of surface occupancy in steep, highly erodible areas would prevent long-term impacts on deer and elk habitat by preventing displacement and erosion in areas used for cover. The probability of this occurring is moderate.

Mitigating measures developed to protect wildlife habitat would prevent any surface disturbance on approximately 36,000 acres (1% of the resource area) and seasonal surface disturbance on approximately 390,000 acres (12% of resource area). This would benefit wildlife in the long term by preventing disturbance of important seasonal habitat for priority species during crucial periods such as parturition and winter. Seasonal and "no surface occupancy" stipulations to protect wildlife habitat are applied only 30 to 40% of the time; however, without such stipulations attached to leases or sales, wildlife habitat and thus populations would decline. These mitigating measures are often waived after a site-specific analysis.

A long-term impact would result from surface-disturbing activity and placement of permanent facilities in elk crucial winter range and calving areas and within the four designated big game winter ranges. There is a low probability of such impacts occurring.

HMPs would provide for a cooperative improvement of wildlife habitat with the state wildlife agency, interest groups, and landowners. The resulting improvement of wetland habitat and fisheries would be a long-term benefit for wildlife. The probability of improving habitat through HMPs is high.

No protective stipulations would be developed within the three WSAs to protect crucial wildlife habitat from surface-disturbing impacts; however, nonimpairment criteria are in effect. Therefore, there would be no effect on wildlife in the Gardner Mountain, North Fork, and Fortification Creek WSAs.

The cumulative effects on wildlife of continuing present resource programs under this alternative would be a long-term slight to moderate loss of

wildlife habitat. Wildlife numbers and species diversity would be lower than desirable as a result of the combined effects of timber harvesting, oil and gas exploration and development, road and right-of-way construction, ORV use, and less than desirable condition of range and riparian habitat. Because of the resulting habitat disturbance and displacement of animals, there would be fewer opportunities for wildlife-related recreation such as hunting, fishing, and wildlife observation.

Wildlife habitat, and consequently wildlife numbers, decreased slightly (less than 5%) over the past ten years. The decline in wildlife numbers would be expected to continue over the long term under this alternative.

EFFECTS ON SOCIOECONOMIC CONDITIONS

Effects on Agricultural Economics

None of the alternatives proposed in this document would have significant impacts on agriculture. Because agriculture's importance to the economy in the area is relatively small, and because the BLM's contribution to agriculture's requirements is small, the effect of the BLM's programs and policies (through agricultural linkages) on the area's economy will be relatively insignificant. However, because of typically low returns to agricultural investment the significance of BLM's programs and policies to individual operators may be greatly magnified.

Table 4-2 presents an analysis of grazing impacts in Johnson County under the range proposals with a comparison of returns after operating costs that would result under the alternatives. It should be noted that although there would be grazing impacts under the cultural and timber management programs, they would be minimal and would be unlikely to affect the same operators; therefore, they will not be considered in any cumulative sense. Furthermore, because the range proposals will affect groups of operators only in Johnson County, the comparisons of returns are limited to Johnson County.

The returns in the table are the result of applying the various levels of animal units under the alternatives to the line $y=116.02 x -1301.65$, which was derived from the returns after operating costs in table 3-34 of chapter 3. It is particularly

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TABLE 4-2
COST-BENEFIT RATIO, GRAZING IMPACTS AND RETURNS AFTER OPERATING COSTS
IN JOHNSON COUNTY UNDER EACH ALTERNATIVE

	Cost-Benefit Ratio			
	Alternative A ^a	Alternative B ^b	Alternative C	Alternative D
Cost-benefit ratio as derived from the Wyoming Rangeland Investment Analysis Program ^c	0.14:1	1.05:1	0.94:1	0.54:1
Analysis of Grazing Impacts in Johnson County under the Range Proposals				
Change in livestock carrying capacity (AUMs ^d)	0	+ 3,250	+ 3,850	- 8,800
Number of operators affected	0	12	12	30
Average change per operator (AUMs)	0	+ 271	+ 321	- 293
(AUS ^e)	0	+ 23	+ 27	- 24

Comparison of Returns after Operating Costs to Operators of 75, 400, and 1,000 Cow Enterprises
in Johnson County under the Alternatives^e

	Alternative A AUS ^f Returns	Alternative B AUS ^f Returns	Alternative C AUS ^f Returns	Alternative D AUS ^f Returns
75 cow enterprises	98 \$10,068.00 \$102.00	121 \$12,737.00 \$105.26	125 \$13,201.00 \$105.61	74 \$7,284.00 \$98.43
400 cow enterprises	516 \$58,564.00 \$113.50	539 \$61,233.00 \$113.60	543 \$61,697.00 \$113.62	492 \$55,780.00 \$113.37
1,000 cow enterprises	1,287 \$148,015.00 \$115.01	1,310 \$150,685.00 \$115.03	1,314 \$151,149.00 \$115.03	1,263 \$145,231.00 \$114.99

a. No Action Alternative

b. Preferred Alternative

c. The ratios were generated by the Wyoming Rangeland Investment Analysis Program in response to all benefits that would be derived under each alternative in conjunction with the costs that would be incurred both by the BLM and by operators under each alternative.

d. Animal unit month.

e. This assumes that BLM grazing is the limiting factor in each case and that an operator's herd inventory will change in direct proportion to the average change in carrying capacity. For example, an increase of 240 AUMs would cause inventory herds to increase by 20 AUs. (20 AUs x 12 months = 240 AUMs)

f. Animal unit.

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noteworthy that Alternative D would entail 28% reduction in income after operating costs for the operator of a 75-cow enterprise.

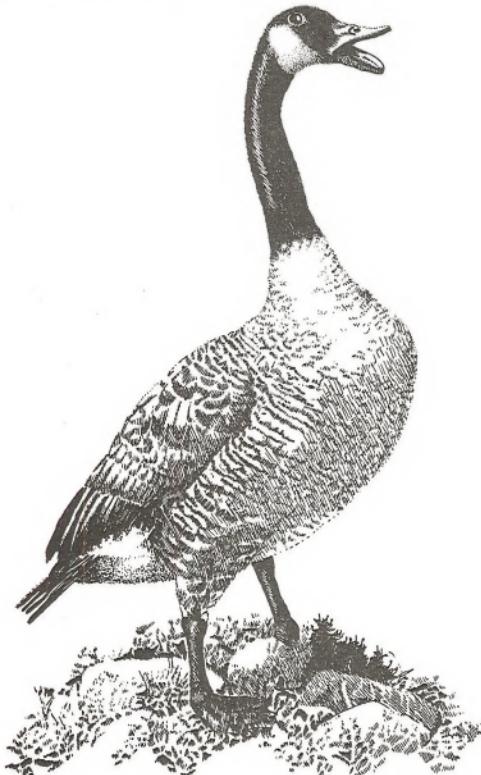
Other Socioeconomic Effects

There would be no significant socioeconomic impacts under any of the alternatives in this document. The following statements on the subjects of coal, recreation, and wilderness are included to emphasize this point.

Because this document is intended only to define lands available for further coal leasing consideration and alternative coal leasing levels

are not defined herein, employment and population levels will not vary from those envisioned in chapter 3. The socioeconomic impacts of further coal leasing will be addressed in a separate EIS when alternative leasing levels have been defined.

None of the alternatives would cause the demand for outdoor recreation to differ from that projected in table 3-14 in chapter 3. In addition, if equal access to outdoor recreation would be provided under all alternatives, no single alternative would have an inherent advantage toward satisfying the projected demand; however, if access is not provided or is restricted, as in the case of wilderness, the demand for outdoor recreation may be unfulfilled.



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ALTERNATIVE B: THE PREFERRED ALTERNATIVE

The effects on the air resources, salable minerals, topography, and socioeconomic conditions would be the same as those described for Alternative A.

EFFECTS ON CULTURAL RESOURCES

Effects on cultural resources would be the same under Alternative B as under Alternative A, except for the following:

Writing CRMPs for Cantonment Reno, Dull Knife Battlefield, and the Outlaw Cave Archeological District would benefit cultural resources by preserving scientific information and interpreting the site for the public. Known cultural sites would be protected on 4,360 acres. This figure is smaller than in Alternative A because of inventories that have been completed.

The cumulative effects of Alternative B on cultural resources would have no known direct adverse impacts on cultural resources. There is a low potential that surface-disturbing activities associated with fire, forest, grazing, lands, recreation, minerals, and visual resources management might inadvertently damage cultural sites. However, for the most part this alternative would have positive effects by increasing our knowledge of regional prehistory and history.

EFFECTS ON LAND USES

Effects on Forestry

A beneficial consequence of prescribed burning for forest site preparation would be a short-term improvement in growing conditions. In the long term, this might lead to increases in annual timber sale offerings.

Approximately 10 MMBF of green timber from commercial forestlands, 1 MMBF of green timber from the woodlands, and an estimated 1.5 MMBF of dead timber from both commercial forestlands and woodlands would be offered for sale. Acquisition of easements for forestry purposes and implementation of planting and thinning projects would support the proposed harvest and therefore benefit the forestry program.

Adjustment of livestock use on commercial forestlands would result in improved growing conditions and eventually lead to an overall increase in timber sale offerings from commercial forestland.

Approximately 200 acres of public woodland would be lost because of coal mining and 300 acres because of oil and gas activity over the next ten years. This would cause no significant impact to the forestry program.

If oil and gas activity took place on commercial forestlands in the south Big Horns, it could cause adverse effects. The construction of drilling locations and associated access roads on commercial forestlands would deplete the timber base. This could cause postponement of planned timber sales or reduction in volume.

The chance that oil and gas development will occur in the south Big Horns in the short term is minimal. In the long term, the probability of occurrence would continue to increase. The impacts associated with possible oil and gas development on commercial forestlands would be reversible, but not until the oil and gas resources were depleted.

Commercial forestland and woodlands in WSAs would be recommended for return to full multiple use under this alternative. This amounts to approximately 22 MMBF of timber in 3,650 acres of commercial forestland and 2,660 MCF of wood products in 5,900 acres of woodlands. If Congress accepted the recommendation, the forestland would then become available for timber harvesting.

The cumulative effects of Alternative B on forestry would be an increase in harvest to a total of 10 MMBF of commercial timber, 1 MMBF of green wood products from woodlands, and 1.5 MMBF of deadwood. This harvest would provide ample opportunity for the forestry program to meet the projected increased future demand for BLM timber.

Effects on Grazing

A long-term loss of livestock forage would result from exclusion of livestock on cultural sites. Preliminary analysis of cultural sites proposed for protection indicates that livestock use may compromise cultural resource values on two sites, Cantonment Reno and a portion of the Bozeman Trail. On the basis of the preliminary

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analysis, the probability of the impact occurring is estimated to be 40 to 50%.

Approximately 920 acres with an annual forage production capacity of 150 AUMs would be lost if livestock were excluded from cultural sites. Fencing of the 600-acre Cantonment Reno site probably would disrupt the normal livestock operation and management of the grazing lease because it would block access to forage and to water from a well and the Powder River at that site.

The use of prescribed fire to manipulate vegetation on 500 acres would result in a long-term annual increase in forage production of an estimated 100 AUMs. This effect would result from release of the understory herbaceous vegetation following removal of the sagebrush-dominated overstory. Personal communication with personnel from the local SCS office and area ranchers revealed that there is a high probability that forage production would increase by at least 100 AUMs following a 500-acre prescribed burn. No irreversible or irretrievable commitments of the resource would be made, and no unavoidable adverse impacts would occur as a result of implementing this action.

The potential for short-term loss of forage, management facilities, or livestock would increase from application of limited wildfire suppression on 634,000 acres. An estimated 60 to 70% of the livestock operations in the resource area could be affected. However, it is unlikely that an actual loss would occur because of the low incidence of wildfire in the resource area and the fire control assistance available from the county.

Suspension or adjustment of livestock use on commercial forests following timber harvest would result in a long-term loss of an estimated 100 AUMs of forage on 2,150 acres in seven to eight grazing leases. The probability of this impact occurring is estimated to be moderate. This estimate is based on past experience in the resource area.

Exclusion of livestock from commercial forest sites where livestock use has impaired the productive capacity of the site would result in a long-term loss of an estimated 50 AUMs on a maximum of 1,000 acres in two to three grazing leases. It is unlikely that this impact would occur. This estimate is based on the limited number of sites identified where livestock use apparently has reduced timber productivity.

Actions proposed under the forestry program would cause an unavoidable adverse impact to two or three individual operators through disrupt-

tion of normal livestock grazing and use of their grazing leases. The disruption of use would occur if large (more than 100 acres) or strategically located exclosures (such as those blocking access to water) were constructed around the forest sites. On the basis of past experience, it is estimated that the probability of this impact occurring is low. Most timber sales involve areas smaller than 100 acres or occur where limited livestock use would not cause a significant loss in forest regeneration or productivity.

Control of noxious weeds on public land would benefit livestock grazing in the long term by increasing forage production from weed-infested rangeland. Approximately 300 acres on five to ten grazing leases would be affected annually. The increase in forage production would result from release of forage plants on sites where leafy spurge or other noxious weeds have crowded out desirable plants. It is estimated that a maximum of 100 AUMs of new forage would be produced from the treated lands. The probability of this impact occurring is estimated to be moderate. The estimate is based on observation of response of forage production following treatment of sites in the resource area.

Implementation of AMPs would result in a short-term increase in forage production on 10 to 12 "I" category allotments, where increase of 3,250 AUMs would occur (from 11,188 to 14,438). In the long term, forage production from all 29 "I" allotments would increase by 13,000 AUMs (from 28,968 to 41,968). The increase in forage production availability would result from construction of range improvements and improved range condition.

Construction of range improvements such as water developments and cross fences would result in more efficient use of forage by improving distribution and making most of the grazing land in the allotment available for livestock use. Improved range condition would provide for increased stocking rates because the recommended stocking rates increase as rangeland approaches excellent (climax) condition.

It is expected that condition would improve by approximately one condition class (for example, fair to good) within ten years following implementation of an AMP. However, the actual rate at which range conditions would improve depends to a large extent on the initial condition of the range and the production potential of the range sites. Range condition would improve most rapidly on the more productive range sites and on areas that were initially in fair or better condition. A

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slower rate of improvement would be expected on poor condition ranges or on areas dominated by low production range sites.

Intensive grazing management systems implemented in conjunction with AMPs would contribute to improved range condition by providing for replenishment of plant root carbohydrate reserves, seed production, seedling establishment, and scattering and trampling (planting) of seed. Range improvements and grazing treatments associated with this type of management also would provide for a proper forage use level of between 40 to 60% of the current year's growth and improve distribution of livestock grazing. Improved distribution of livestock would ensure more evenly grazed range rather than a range with areas where the forage is overused and other areas that are used very little.

No current information is available regarding range condition except for approximately 45,000 acres inventoried in 1983. On the basis of projections from this survey, it is estimated that short-term and long-term changes in range condition would occur as shown in table 4-3. The probability of the identified impacts occurring is estimated to be moderate. The estimate is based on professional judgment.

Construction of range improvement facilities would result in short-term surface disturbance of 300 to 400 acres over the ten-year life of this plan. Consequently, approximately 60 AUMs would be lost in the short term on 20 to 25 grazing leases.

Livestock forage would be reduced by 10 AUMs on 50 acres in the long term from occupancy of the surface by range improvement facilities and concentrated livestock use in the immediate vicinity of 120 water facilities. The probability of these effects occurring is estimated to be low on the basis of past experience in the resource area and professional judgment.

Disturbance of vegetation associated with right-of-way construction would cause a short-term loss of an estimated 400 AUMs on approximately 2,500 acres in 50 to 75 grazing leases. The probability of the impact occurring is estimated to be moderate on the basis of past experience in the resource area.

Extended use of roads or structures would cause a long-term loss of 40 AUMs on 250 acres. The probability of this occurring is estimated to be moderate on the basis of past experience in the resource area.

Disposal of public land under the R&PP Act would result in a long-term reduction of forage available for livestock use by approximately 150 AUMs on two to three grazing leases. This effect would occur with full development of the R&PP areas. There is a high probability of this impact occurring because livestock grazing is not compatible with the planned development of R&PP sites. The loss of livestock production from R&PP lands would be an unavoidable adverse impact of the disposal action.

TABLE 4-3
CHANGES IN RANGE CONDITION
UNDER ALTERNATIVES B AND C

Allotment Category	Estimated Acreage of Present Condition		Projected Acreage of Short-term Condition		Projected Acreage of Long-term Condition	
	Poor and Fair	Good and Excellent	Poor and Fair	Good and Excellent	Poor and Fair	Good and Excellent
Maintain	53,455	267,526	40,090	280,891	30,068	290,913
Improve	71,056	202,236	40,056	233,236	25,056	248,236
Custodial	36,516	103,930	32,516	107,930	28,516	111,930
Total	161,027	573,692	112,662	622,057	83,640	651,079

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Coal mining would result in a short-term loss of approximately 2,500 AUMs on 18,000 acres in the resource area. However, fewer than 10 AUMs would be removed from public surface land. In the long term, forage production from mined lands following reclamation would at least equal, and probably exceed, premining production levels. The probability of the impact occurring is estimated to be moderate to high. The estimate is based on projected mining activity and past success in reclaiming mined land. The short-term loss of forage production on mined land would be an unavoidable adverse impact.

Disposal of mineral materials would result in a short-term loss of 40 AUMs on public land from mining of an estimated 300 to 400 acres on 20 to 30 grazing leases. A long-term loss of 10 to 15 AUMs would be expected to result from lowered forage productivity of the sites following reclamation. The long-term loss of productivity would occur because most sites where mineral materials are mined are characterized by very shallow soils. Vegetative productivity of these shallow soils is low, and they are extremely sensitive to disturbance.

Because of the soil mixing, soil loss, and reduction in fertility that inherently occur when a site is mined, it is expected that a mined site would not be as productive after disturbance as it was before. This effect would probably occur even though the topsoil is normally stripped, saved, and replaced following mining. The probability of the effects occurring on a given mine site is estimated to be moderate. The estimate is based on professional judgment and experience in the resource area. The long-term reduction of forage productivity would be an unavoidable adverse impact and an irreversible and irretrievable commitment of the resource.

Surface disturbance associated with seismic exploration and with oil and gas exploration and development would cause a short-term loss of an estimated 2,000 AUMs on 12,000 acres—600 AUMs on 4,000 acres of public surface and 1,400 AUMs on 8,800 acres of private surface over federal minerals. Approximately 100 to 120 grazing leases (27%) would be affected to varying extents.

Long-term loss of an estimated 600 AUMs (420 AUMs on federal mineral estate land and 180 AUMs on public surface) would result from extended use of sites for producing oil wells and access roads. Forage would be unavoidably lost in the long term on approximately 2,520 acres of federal mineral estate and 1,080 acres of public land. The probability of these impacts occurring

is moderate to high. The estimate is based on past experience in the resource area and on projected oil and gas activity over the next ten years. The effect on individual leases would depend on the intensity of oil and gas activity in each area. Significant effects would be expected in the vicinity of developed oil and gas fields and known KGSSs.

ORV designation on 286,797 acres of public land in Sheridan and Campbell counties could reduce loss of livestock forage by limiting damage to vegetation from off-road travel. In areas where ORV use is high, designation and enforcement of the designated routes could result in locally significant savings of forage.

Development of certain types of range improvement facilities in certain areas could be precluded by prohibition of surface disturbance or occupancy to protect visual resources in Middle Fork Canyon, North Middle Pumpkin Butte, and Dry Creek. The probability of this effect occurring is low because the visual effects of most range improvements can be mitigated so that adverse visual effects are



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significantly reduced; thus, it is expected that the occupancy or disturbance restrictions normally would be waived.

Fencing of the seepage area of spring developments would benefit livestock grazing in the long term by improving the quality of water produced at the site, reducing project maintenance costs, and extending the useful life of the development. This impact would occur on an estimated six to seven spring development sites. The probability of occurrence is estimated to be high. The estimate is based on past experience and knowledge of area personnel.

Surface protection and reclamation decisions generally benefit livestock grazing by limiting long-term loss of site productivity and enhancing site reclamation following disturbance. It is estimated that this effect would occur on approximately 1,000 acres over the life of the plan. The probability of the surface protection decisions preventing a significant loss of forage on a given site is estimated to be moderate. The estimate is based on professional judgment and past experience in the resource area.

Development of some range improvement facilities could be precluded by wildlife management decisions prohibiting surface disturbance or occupancy on crucial winter ranges, sage grouse and sharp-tailed grouse leks, and raptor and bald eagle nest sites. The probability of this effect occurring is low because the adverse effects of construction of range improvements usually can be mitigated or avoided; therefore, the stipulation probably would be waived in most cases.

The cumulative effects on grazing from Alternative B would be a slight increase in forage production.

Use of the public land for livestock grazing is affected in two ways by actions proposed under this alternative. The principal effect is the increase or reduction in forage available for use by livestock. Some actions also affect operations or the management of livestock use.

Surface-disturbing activities authorized on the federal mineral estate and public surface land under the grazing management, lands and realty, and minerals programs would result in a short-term loss of approximately 5,000 AUMs on 33,000



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acres (3,900 AUMs on 26,000 acres federal mineral estate and 1,100 AUMs on 7,000 acres on public surface).

Exclusion of grazing on certain forest and cultural resource sites would result in a long-term reduction of 300 AUMs on 3,700 acres of public surface. Long-term uses, surface disturbance, and reduction of site productivity resulting from actions proposed under the grazing management, lands and realty, and minerals programs would result in a long-term loss of approximately 800 AUMs on 4,600 acres (420 AUMs per 2,600 acres on federal mineral estate and 380 AUMs per 2,000 acres public surface land).

In the short term, actions proposed under the grazing management program would result in a 3,250 AUM increase in forage on approximately 130,000 acres in 10 to 12 grazing allotments.

Long-term increases in forage production would be expected as a result of actions proposed under the fire management, livestock grazing, and recreation programs. An increase of 13,000 AUMs on about 272,300 acres in 30 to 35 allotments would be expected in the long term as a result of actions proposed under these programs. Most of the increases in forage production would occur as a result of improved range condition, primarily on the "I" category allotments.

Construction of exclosures to protect cultural sites and forest management areas could have significant effects on grazing management of seven to ten allotments. These effects would result from changes of livestock use patterns or access to water, forage, and cover caused by construction of fences around the protected sites. The ultimate effect on livestock grazing would be measured in terms of highly localized (allotment-specific) reductions in livestock production.

None of the short-term or long-term changes in forage or livestock production are considered significant when evaluated against the total livestock production of the resource area or region. The changes in livestock forage production proposed under this alternative represent a change of less than 0.75% of the total resource area forage production (estimated at 2 million AUMs), and a change of less than 14% of the total forage produced on public land. However, the effects described could be significant for individual operators on specific allotments. Site-specific effects would be analyzed in an environmental assessment to be prepared in conjunction with implementation of AMPs.

Effects on Lands and Realty

The discussion of corridors and communication sites for Alternative A also applies to this alternative.

For the purpose of this analysis it has been assumed that 1,000 acres per year would be sold or exchanged. If approximately 1/3 of that assumed acreage adjustment took place in each county in the resource area, there would be a maximum loss of payments in lieu of taxes as follows: Campbell, \$206.67; Johnson County, \$86.66; and Sheridan County, \$163.33. This would be partially offset by tax receipts to the counties as follows: Campbell County, \$66.66; Johnson County, \$76.66; and Sheridan County, \$29.99.

Approximately 1,000 acres per year deemed uneconomical to manage would be subject to ownership adjustment. Exchanges, which would usually "block up" federal lands, would be a benefit both to the BLM and to the private surface owners involved. They would decrease the cost of managing the land and permit more intensive management. These long-term, irreversible effects would be beneficial to all parties concerned except the county governments. There is a high probability of this occurring.

A short-term adverse impact in the form of added expenses would be caused by the use of buried cable in place of overhead power lines for protection of the visual resource. Although the cost of electrical buried cable depends on the length of the line, it is estimated to be 1-1/2 times the cost of overhead lines, excluding trenching costs, and it lasts about half as long. The probability of this expense being incurred would be low.

Prohibiting surface disturbance on approximately 15,440 acres in the Red Wall area, Middle Fork Canyon, North Middle Pumpkin Butte, Dry Creek area, and within 200 feet of highways would not cause significant impacts, since most of those sites are not near areas in which surface-disturbing lands activities would occur. For this reason, adverse effects are unlikely to occur.

Actions required by the soil, water, and air program to protect areas of severe erosion hazard would cause delays in construction activities because surface-disturbing activities would be prohibited on approximately 655,000 acres during specified times of the year. This would be a short-term adverse impact. The possibility of gas wells being shut in and of roads in poor condition being used for hauling are similar to those discussed for

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Alternative A. Construction activities are unlikely to be affected because the restriction can be waived case by case.

The discussions for Alternative A on added costs to grant holders for reclamation, wildlife restrictions, and seasonal restrictions on pipeline construction also apply to this alternative.

The discussion under Alternative A of long-term adverse impacts caused by restrictions on surface occupancy applies to Alternative B as well, but Alternative B would place restrictions on 80 acres of eagle winter roosts in addition to the species listed for Alternative A. Costs of rerouting would be the same as in Alternative A.

Cumulative effects of Alternative B on lands and realty would be added costs to operators brought about by various protective measures, but beneficial effects from improved management and land ownership adjustments. Designating corridors and planning communication site use would have long-term beneficial effects in improved management.

Surface ownership adjustments could affect 1,000 acres of land surface per year. This would be a long-term beneficial effect for the federal government and the private surface owners involved. An adverse long-term impact would be the loss of revenue to the counties in the form of payments in lieu of taxes.

Seasonal use restrictions for protection of wildlife habitat and areas of severe erosion hazard could prevent the use of approximately 724,000

acres of federal land surface during specified times of the year. However, it should be noted that the actual acreage would be less because several restricted areas overlap each other and because the requirement for protection of areas of severe erosion hazard can be waived case by case. These adverse impacts would be short term. This could cause delays in construction activities that could result in wells being "shut in" or roads in poor condition in spring being used for heavy loads.

Financial impacts during the construction of rights-of-way would result from the need to avoid approximately 8,000 acres of critical wildlife habitat. Routing around those areas would require additional construction, material, cultural surveys, and engineering. Other financial impacts would be caused by protecting the soil from erosion, enhancing revegetation, and protecting visual resources.

Effects on Recreation

As in Alternative A, forestry activities under Alternative B would have a tendency to shift the recreation opportunities from semiprimitive to those that occur in roaded natural settings. Under Alternative B, approximately 2,000 acres would be disturbed by timber harvest over the next ten years.

The development of public access to the Gardner Mountain and North Fork WSAs would open approximately 51,000 acres of public land for recreational use by the general public. There is a high probability that this would occur because of the strong demand for access to public land in the resource area. The development of this access would have a beneficial effect on the availability of recreational opportunities.

In general, the effects of forest development of the recreation resource area not considered of great significance. The shift to a roaded natural setting for recreation is considerable in that it represents the irretrievable loss of unroaded recreational opportunities. The unroaded areas, which make up only about 0.4% of the tri-county area, are a disappearing resource. On the other hand, the shift to a roaded natural setting is not very disruptive or apparent; therefore, it would be of relatively little consequence.

Most of the areas subject to forest development are little used now because there is no public access. As in Alternative A, the introduction of

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Courtesy of Wyoming Game and Fish Department

haul roads into the area would do little to change this. Therefore, any effect on recreational setting would have little significance because fewer people would observe it.

The discussion under Alternative A of the effects on recreation from grazing and the disposal of public land also applies to Alternative B.

Prohibiting surface disturbance or occupancy on R&PP sites would affect approximately 600 acres of public land in the resource area. There would be a positive long-term effect on recreation at the R&PP sites. Because of the small amount of acreage involved, there is a 10% probability that this impact will occur.

The effects on recreation from development of coal and oil and gas would be the same as those described for Alternative A.

Opportunities for motorized recreation would be slightly reduced as a result of ORV designations in Sheridan and Campbell counties on approximately 287,000 acres. Areas where opportunities would be reduced are Weston Hills, Four Corners, and Dry Creek. This effect would be considered minor. ORV designations would enhance opportunities for nonmotorized recreation in the Fortification Creek and Rochelle Hills area. This would be a minor positive effect. There is a high probability that these effects will occur because of the great demand for ORV areas.

If Congress accepts the recommendation not to designate the three WSAs as wilderness, it is highly probable that the opportunity to experience primitive recreation in the resource area would be slightly reduced. Impacts on recreation would be moderate and long term.

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The cumulative effects of Alternative B on recreation would be degradation in recreational quality due to timber, grazing, and oil and gas development and a reduction in opportunities for primitive recreation.

Land sales would cause minor additional loss of the resource base, while coal development would result in the estimated doubling of population pressure on the resource. ORV designation would reduce opportunities for motorized recreation in several areas while enhancing the quality of nonmotorized recreation.

Development of public access to the Gardner Mountain and North Fork areas would open approximately 51,000 acres of public land for recreation. In sum, adoption of this alternative would result in a moderately significant negative effect on recreation, except for the development of access, which would have a significant positive effect.

EFFECTS ON MINERAL RESOURCES

Effects on Leasable Minerals

Effects on Coal

Of the approximately 38 billion tons of federal coal available for further consideration for competitive leasing under this alternative, about 32 billion tons is uncommitted. About 6 billion tons of the uncommitted coal is in preference right lease applications and 6 billion tons in delineated coal tracts. About a 20 billion ton reserve would be available for any future coal leasing needs beyond the coal reserves in delineated tracts and PRLAs. Coal leased and subsequently developed would be an irreversible and irretrievable commitment of those resources.

Confinement of coal development in the next ten years in central Campbell and north central Sheridan counties should ensure an adequate supply of uncommitted coal to meet projected demand. This assumes that coal lease sales would occur every two years at a rate of about 2 billion tons. While that is not likely to occur, the total requirement to meet that need would be about 20 billion tons.

Priorities are assigned to identify coal areas as either high or low priority. Development efforts are channeled into high priority areas, while low

priority areas are allowed to remain in the background until a change either in coal production information or in the management situation can bring them into a higher priority. Such changes could be in the form of proposed exchanges, new drilling information, or increased national needs for coal.

High priority areas are defined as those near current production and shipping facilities with favorable economics for development. They may be in or near areas of interest to industry. Another consideration in the identification of high priority areas relates to ease of reclamation. Areas with coal in large blocks or in concentrated areas are subject to fewer environmental problems related to mining and distribution of coal.

High priority areas in the Buffalo Resource Area are central Campbell County and north central Sheridan County. These areas cover 454,000 acres containing about 32 billion tons of coal. It is projected that the quality and quantity of those reserves is sufficient to meet expected demands during the life of this plan.

Conversely, low priority areas are identified through their lower coal quality, lower projected economics, greater distance from existing transportation and development facilities, lesser interest in development by industry, and greater projected environmental problems related to mining.

Establishment of priority areas would simplify and streamline the coal development process by allowing similar related areas to be addressed rather than requiring consideration of development in scattered, dissimilar areas with large variations in economic and environmental considerations. The ability to respond to noncompetitive needs would not be affected. All federal coal land where the coal screening process has been completed would be available for noncompetitive needs.

Establishment of priorities for coal development in the Buffalo Resource Area would have the greatest effect on Sheridan, Gillette, and Wright. These three cities and their respective counties have shown a high capacity for absorbing growth. Broad-based acceptance of rapid growth would be more likely in Campbell County than in Sheridan County. Extensive expansion of the industrial base of Campbell County would be socially compatible with the present community structure.

Sheridan is still seen as the "old West," and intensive coal development undoubtedly would change that. While Sheridan has become increasingly urbanized and industrialized, a significant increase in coal development could create severe

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management issues. Some of these could be very stressful because Sheridan would also have to contend with other coal development in Montana. The development north of Sheridan would not be expected to be as intense as near Gillette.

Specific social and economic impacts associated with leasing tracts for the second Powder River lease sale are discussed in the draft Round II Powder River coal EIS (USDI, BLM, 1984a). Should there be another lease sale, the associated impacts would first be addressed in an EIS.

Flexibility to redefine or eliminate competitive coal tracts after they had been considered for sale in a leasing round would be beneficial. Tracts that were not selected or sold probably would be those with environmental or development problems. For example, the Bitter Creek tract was not selected for the second lease sale because its overall desirability for leasing is low. The tract has high stripping ratios and low British thermal unit (Btu) content, and its development would require several miles of railroad construction. Steep terrain, alluvial valley floors, and significant wildlife problems are other concerns.

There are other delineated coal tracts like Kumor Draw, Twentymile Butte, and Scotty Draw that harbor various potential problems if development should occur. Some of these problems are poor reclamation potential, potential alluvial valley floors (AVFs), and important wildlife habitat, including sage grouse leks and eagle nests. There is a definite need for some mechanism that allows these type of tracts to be redelineated or dropped from further consideration. Otherwise, public surface and coal could be tied up for long periods of time in tracts where development might never occur. Dropping the poorer tracts would not reduce coal availability.

Leasing federal oil and gas estates inside coal leases subject to pre-existing rights would lessen the probability of conflicts between oil and gas development and surface mining. This simultaneous leasing would reduce to zero the probability of losing federal oil and gas from peripheral drainage.

Sale or exchange of public lands that overlie developable federal coal might prohibit coal development because of the requirement for



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surface owner consent. There is a low probability that a new surface owner would not consent to surface mining. Loss of the opportunity to mine that coal would be adverse. In the "worst case," about 100,000 acres out of the approximately 190,000 acres available for exchange or sale would contain coal with development potential. However, there is no reason to believe that the coal beneath all these lands would be developed. Federal surface inside the priority competitive leasing areas, PRLAs, coal leases, and delineated coal tracts should not be considered for sale until the coal is mined.

Disposal of isolated tracts available for sale and exchange in Johnson and Sheridan counties could proceed without adverse impacts to the coal resource. Isolated tracts that would be disposed of in the rest of Campbell County would have the highest likelihood of containing developable coal. These lands should be considered after those in Sheridan and Johnson counties. It is assumed that the EA, land report, and mineral report required before sale would eliminate disposal tracts with high coal development potential.

Effects on Oil and Gas

As in Alternative A, the requirement for cultural surveys for well locations, access roads, and flow lines would involve added expense. The costs discussed under Alternative A also would apply to this alternative. If one or more significant sites should be discovered, and if a road or flowline must be rerouted or a drilling location moved, additional costs would be incurred. Each archeological survey would cost about \$300. These costs would be an adverse short-term impact for the grantee.

Securing an archeological clearance for the initial route is always required; however, the probability for additional expenses to relocate the proposed activities is low if a 40-acre survey is completed.

Recommending that seismograph companies obtain a Class III cultural inventory in specified areas would cause more expense to the operator than at present. The only time a seismograph company is now required to obtain a Class III inventory is when earthwork is performed. Added expenses would be approximately \$200 per mile of seismograph line. This would be an adverse, short-term impact to the companies.

A beneficial long-term effect would result from the postponement of land ownership adjustments until disposal would not interfere with the devel-

opment of oil and gas. Approximately 1,000 acres of public land per year would be affected by this decision, which would prevent added expenses in the form of surface damage fees that the new owners probably would require (a high probability). The fees would vary. A list of possible costs is included in the discussion of effects on oil and gas for Alternative A.

There are no rental charges to the oil and gas companies for use of federal lands that are either on the same oil and gas lease as the well or within a production unit.

Alternative B, like Alternative A, would not allow oil and gas activity to occupy or disturb the surface of 600 acres of R&PP areas. The effects of that requirement are described under Alternative A.

The oil and gas reserve is available for leasing on 99.98% of the mineral estate in the resource area. Provisions are available to lease all the federal mineral estate except approximately 800 acres underlying incorporated cities and towns. This is a long-term beneficial effect. The oil and gas resources that underlie those 800 acres of cities and towns (0.02% of the federal oil and gas reserves in the resource area) would not be available. Therefore, that resource would be irretrievably lost. The probability of oil and gas leasing occurring in the entire resource area is high. This estimate is based on industry interest and on open oil and gas filings received.

Decisions in the recreation and VRM program would prohibit surface disturbance for oil and gas development on approximately 16,000 acres under this alternative. It is unlikely that this would happen because of the location of the areas involved in relation to the areas in which oil and gas operations are generally concentrated. Generally speaking, this adverse impact would be minor because most areas are small and could be drained by conventional drilling outside the "no surface disturbance" areas. (A rule of thumb is that oil and gas reserves can be drained by conventional drilling methods for up to $\frac{1}{2}$ mile.) Leases requiring directional drilling are not issued unless the lessee/operator so requests. The costs involved are discussed under Alternative A.

The requirement of camouflaging all permanent facilities would be a short-term unavoidable adverse impact. The discussion of camouflaging for Alternative A also applies to Alternative B.

The requirement that there be no surface disturbance on slopes of more than 25% for oil and gas development would have a minor long-term

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adverse effect on oil and gas development on about 281,000 acres, or approximately 9% of the resource area. There would be a low probability of the restriction being applied at the time of drilling. The effects are further discussed under Alternative A.

Added costs for construction of access roads and well pads could be incurred by oil and gas operators because of seasonal prohibition of surface activity to protect susceptible soil from erosion. About 1,819,000 acres (60% of the resource area) would be affected by such restrictions under Alternative B. These restrictions also could upset the drilling schedule of some lessees. If the companies had to drill in winter, removing snow and breaking up the frozen ground could add \$3,000 to \$6,000, or as much as \$10,000 to the cost of constructing a well pad and access road that could be constructed during less severe weather for approximately \$12,000 to \$15,000. This would be an unavoidable adverse impact. The probability that this would happen is low because spring seasons generally are dry in this area.

The effects on oil and gas from prohibition of surface disturbance for the protection of critical wildlife habitat are discussed under Alternative A. That discussion also applies to Alternative B.

Prohibition of surface disturbance from oil and gas activity during specified times of the year to protect wildlife during critical periods would have an adverse effect on approximately 391,000 acres, or approximately 13% of the federal minerals in the resource area.

Costs could be added to construction of access roads and well pads, and the drilling schedules of some lessees could be upset. If this restriction caused the companies to drill in winter, added costs would be similar to those described for seasonal restrictions for soil protection. There is a moderate probability that this unavoidable adverse impact would occur.

A recommendation that the WSAs not be designated wilderness would make available 28,931 acres of federal minerals for oil and gas leasing, if Congress accepted the recommendation of non-

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designation. The minerals would not be available under the "no action" alternative. This would be a beneficial long-term effect.

The cumulative effects of Alternative B on oil and gas would be beneficial in keeping public surface over federal minerals in federal ownership and in making more oil and gas available for leasing, but adverse in restricting surface disturbance for the benefit of other resources.

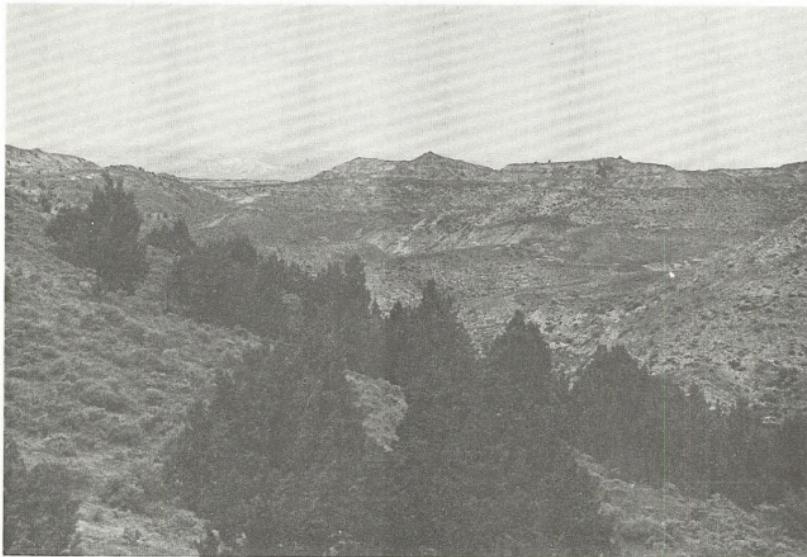
A beneficial long-term effect would result from postponement of land ownership adjustments until disposal would not interfere with the production and development of oil and gas. Approximately 1,000 acres of public land per year would be affected by this decision, which would prevent added expenses in the form of surface damage fees that the new surface owners probably would require (high probability).

Restrictions on oil and gas activity on approximately 370,000 acres of cultural sites, R&PP sites, areas with slopes in excess of 25%, and areas of minerals within coal mines could cause oil and gas operators, at times, to not be permitted to occupy the desired site.

Seasonal restrictions for protection of wildlife habitat or areas of severe erosion hazard could prevent the surface use of approximately 2,210,000 acres during specified times of the year. This could cause added expense to the oil and gas operators because they may be required, at times, to conduct construction and drilling operations during the winter.

Other financial impacts would be caused by avoiding cultural sites, protecting the soil from erosion, enhancing revegetation, protecting visual resources, and selling or exchanging lands without considering oil and gas exploration and development. An added expense not normally encountered in seismographic exploration would be that of obtaining Class III cultural surveys on operations conducted in some areas. These effects would be short term.

Table 4-4 lists the approximate acreages that would be affected by various restrictions on oil and gas activity. It should be noted that there is an overlap of restrictions in a number of areas throughout the list; that is, eagle nests, 25% slopes, and fragile watershed, for example, may occupy the same area.



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TABLE 4-4
RESTRICTIONS ON SURFACE-DISTURBING ACTIVITIES UNDER ALTERNATIVE B

Areas That Would Not be Leased for Oil and Gas	Federal Minerals (acreage) ^a	Total (acreage)	Federal Surface (acreage) ^a	Total (acreage)
Incorporated cities and towns		800		
"No lease total"		800		
<u>Areas With Year-Round "No Surface Occupancy" Provisions</u>				
Wildlife				
Elk calving grounds in Fortification Creek area ^b	4,900		3,800	
Big game winter ranges ^b	27,000		4,000	
Sage grouse leks ^b	3,500		200	
Sharp-tailed grouse leks ^b	240		80	
Eagle winter roosts ^b	300		80	
Wildlife subtotal		35,940		8,160
Area with slopes of more than 25%		281,100		172,100
Cultural sites				
Outlaw Cave Archeological District	60		30	
Cantonment Reno	600		600	
Dull Knife Battlefield	1,400		1,300	
Cultural resource subtotal		2,060		1,930
Visual features				
Red wall	7,200		7,200	
Middle Fork Canyon	12,200		10,200	
Dry Creek Petrified Tree	40		40	
Visual subtotal		19,400		17,440
North Middle Pumpkin Butte and South Middle				
Pumpkin Butte		1,000		1,000
Streams, reservoirs, and wells ^c		19,000		1,200
County, state, and federal highways and railroads		1,500		400
Gillette R&PP area	40		40	
Sheridan R&PP area	560		560	
R&PP subtotal		600		600
Year Round "No Surface Occupancy" total		360,640		202,830
<u>Areas With Seasonal "No Surface Occupancy" Provisions</u>				
Wildlife				
Big game winter range b/c (11/30 - 5/1)	106,000		46,000	
Big game partition areas b (5/1 - 6/30)	9,000		600	
Sage grouse nesting areas ^b (3/1 - 6/15)	170,000		8,000	
Sharp-tailed grouse nesting areas ^b (4/1 - 5/30)	101,000	3,000	14,000	800
Raptor nests ^b (3/1 - 6/30)	1,700			
Eagle winter roosts ^b (11/1 - 3/30)				
Wildlife subtotal		390,700		69,400
Severe erosion hazard (3/1 - 6/15)		1,819,000		655,000
Seasonal "No Surface Occupancy" total		2,209,700		724,000

NOTE: Some restrictions contain provisions permitting a waiver by the authorized officer if the restriction does not apply in a particular case. In some cases, two or more restrictions may overlap on one area.

a. Most acreage figures are approximate. Acreage figures for federal minerals apply to oil and gas development and development of salable minerals. Acreage figures for federal surface apply to all other actions.

b. Acreage figures concerning wildlife populations are estimates. Wildlife populations fluctuate, and restrictions on surface-disturbing activities may increase or decrease accordingly.

c. In these areas, surface disturbance is prohibited, but surface occupancy is permitted.

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EFFECTS ON SOIL RESOURCES

The practice of applying limited fire suppression on parts of the resource area where resource values and fire risk is low would not have a significant impact on soils. There is a risk of larger fires occurring in limited suppression areas, which would increase the impact on surface resources should it occur. Poor fuel continuity and a low fire occurrence characterize limited suppression areas, so that a major fire is unlikely. No significant impacts would be expected.

Impacts on soils from forest management practices, lands and realty actions, and mineral development would be the same as those described for Alternative A.

Construction of range improvements would cause short-term soil disturbance on about 300 acres. Exposure would increase the probability of erosion. However, the effects would be highly localized and insignificant.

Cumulative erosion of soils would not be significant. Soil compaction and site-specific erosion does occur in the immediate vicinity of water facilities, where livestock tend to concentrate, causing moderate losses of soil productivity.

Range condition would be expected to improve on approximately 40,000 acres of rangeland where the potential for soil erosion is high. Soil erosion would be expected to decrease on these rangelands as the vegetation improved to good or excellent condition. The reduction in erosion would occur because vegetation cover and composition of perennial plants increase as condition improves, so that soil exposure and runoff are reduced and water infiltration improves. The probability of these effects occurring is estimated to be low because a number of factors are involved, including soil texture and slope, which affect soil loss as much as vegetative cover, or more.

Prescription burning would be carried out on about 2,200 acres of forestland and rangeland under this alternative. Soils on these burns would be vulnerable to erosion for one to two years. There would be physical, chemical, and biological changes in the soils from burning ground cover and accumulated litter. Overall productivity of the soil would increase in the short term. In the long term, productivity would gradually decrease to pre-burn levels. Productivity has increased by 20 to 60% on other burn areas with essentially the same physical characteristics. The cumulative loss of soil from erosive forces after a burn is not

expected to be significant. In the long term, the increased productivity of the soil would be significant.

Specific impacts on soils associated with coal mining have been addressed in several documents, including various mine plans and the Round II Powder River Coal EIS (USDI, BLM 1984a). Before any coal mining operation can begin, a site-specific EIS must be prepared.

EFFECTS ON VEGETATION RESOURCES

The impacts on vegetation from Alternative B would be the same as those described in Alternative A, except as described below.

Prescribed burns would have a short-term effect of altering approximately 2,200 acres of vegetation (2,000 sagebrush/grassland, 200 acres forestland). Vegetation normally would be reestablished on burned areas within one growing season.

Trees would be harvested from approximately 2,150 acres. A total of 1,730 acres would be partial-cut, and 420 acres would be clearcut. Trees normally would become reestablished within three years after initial disturbance.

The cumulative effects of Alternative B on vegetation would be disturbance of 39,450 acres over the ten-year life of the plan by coal development (18,000 acres), oil and gas exploration and development (12,000 acres), right-of-way construction (2,850 acres), timber harvesting (2,150 acres), noxious weed spraying (1,500 acres), prescribed burning (2,200 acres), mineral material sales (300 acres), range improvement projects (250 acres), and ORV use (200 acres).

In the long term, approximately 5,500 acres would remain unvegetated as a result of roads, producing well sites, and other various types of permanent facilities. The remaining 33,500 acres normally would be revegetated in the short term (approximately three years from initial disturbance). An increase in vegetative growth of about 30 to 40% can usually be expected in new stands of vegetation.

The only irretrievable or irreversible impact that might occur to vegetation would result from coal mining, which would disturb approximately 800 acres of the ponderosa pine/shortgrass prairie vegetative type during the next ten years. Successful reclamation of the ponderosa pine/

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shortgrass prairie vegetative type is questionable, particularly on locations where the subsurface formations have allowed roots of trees and shrubs to penetrate and use available moisture. An additional and possibly more important factor is high soil acidity. Reclamation efforts might not be able to recreate those conditions; therefore, the loss of ponderosa pine and associated understory vegetation might be irretrievable.

EFFECTS ON VISUAL RESOURCES

The effects on visual resources from the lands and realty, coal, and oil and gas programs would be the same as those of Alternative A.

The harvest of trees on 2,150 acres of commercial forest and 200 acres of woodlands would result in some moderate long-term impacts on the visual resource. Degradation of the visual resource in clearcut areas would be significant, and it would be evident for 15 to 20 years. Impacts on visual

resources in woodlands and partial cut areas would be somewhat less significant and would last for 5 to 10 years.

Construction of 150 to 200 range improvement facilities throughout the resource area during the life of the plan would have generally minor long-term impacts on the visual resource. Most range improvements can be designed to have minimal effects on the visual resource, and generally these facilities become less visually intrusive over time. These unavoidable adverse impacts are retrievable and reversible. A maximum of 20 to 30 acres would be directly involved, and the resulting visual impacts to the resource area are considered to be negligible. The probability of occurrence is high because of the number, size, and longevity of such projects.

ORV designation would reduce ORV-related damage to soil and vegetation and by physically limiting this damage on approximately 300 acres of public land. Restrictive measures could be lifted from protected areas by policy change or waiver. ORV designations would protect public land now being used by ORVs, resulting in a



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minor beneficial effect. The probability of realization of this positive effect is considered moderate because of the small area involved.

If Congress accepted the recommendation of this alternative not to designate the WSAs as wilderness, a lower level of protection of scenic qualities would result than would have been applied under wilderness management. Instead of a VRM Class I for wilderness areas, Gardner Mountain and North Fork would be Class II and Fortification Creek Class III. Consequently, there would be some small degradation of visual resources in Gardner Mountain and North Fork WSAs because of possible range improvements or small timber sales.

Visual impacts associated with oil and gas exploration and development would be considered highly probable in Fortification Creek WSA. This impact would be long term but not irretrievable or irreversible.

Cumulative degradation of the visual resource from Alternative B would be expected from the development of oil and gas, coal, and lands and realty resources. Timber harvest and construction of range improvements would have a somewhat smaller negative impact in Gardner Mountain and North Fork WSAs. Fortification Creek, which would be developed according to the Fortification Creek oil and gas development plan, would be subject to long-term insignificant impacts on the local visual resource base. Restriction of surface development of 5,472 acres of significant cultural sites and ORV designation would have a positive but very minor effect on the visual resource. The combination of these consequences would cause considerable negative impact upon visual resources.

EFFECTS ON WATER RESOURCES

The practices of limited fire suppression in low value areas would increase the potential for sedimentation of water sources. Limited suppression areas generally are characterized by a lack of continuous fuels (see the Glossary) and a history of low fire occurrence. The overall potential for increased sedimentation resulting from fires in limited suppression areas is low.

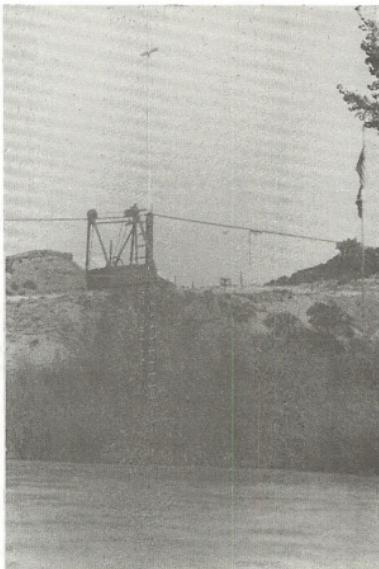
Prescribed burning on approximately 2,200 acres would have the potential to cause a minor short-term increase in sedimentation of down-

stream watercourses. A measurable increase in sedimentation is unlikely because of the small acreage involved and the extended timber over which the burns would take place.

Water yields would increase from 5 to 15% on timber harvest areas in the short term under Alternative B. About 2,150 acres of commercial forestlands and 200 acres of woodlands would be harvested in ten years. Effects on stream flows and water quality would be the same as those described for Alternative A.

The increase in vegetation resulting from improved range condition on 29 "I" allotments (about 40,000 acres) would result in an overall improvement in water quality over the long term. Application of grazing management systems and improvement of livestock distribution would reduce grazing pressure on streams. Implementing these practices would result in short-term and long-term increases in water quality, especially in areas of poor riparian vegetation.

Fencing reservoirs would reduce sediment yields within the enclosure from an estimated 3 acre-



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feet per square mile to less than 1 acre-foot per square mile.

Surface disturbance from lands and realty actions on 2,850 acres in the next ten years would increase the potential for erosion. Sedimentation increases would be expected but would be localized in most cases. Pipeline leaks and ruptures could result in contamination of both surface water and groundwater. The probability of this occurring is low. However, any contamination of water by pipeline fluids would be adverse.

The effects on water from minerals management would be the same as those described in Alternative A.

Removing the interim protection afforded to WSAs would result in development of these areas. The potential for development is high in Fortification Creek and low in North Fork and Gardner Mountain. Oil and gas development in Fortification Creek would cause increased sedimentation and a lowering of water quality in that area in both the short term and the long term.

EFFECTS ON WILDERNESS

Full fire suppression in the WSAs would have a moderate probability of causing some adverse impacts. The use of mechanized equipment for construction of fire lines and trails would reduce the naturalness of the areas. The probability of this occurring in some portion of these areas over the next tens years is low, given past fire occurrence.

Approximately 650 acres in the North Fork and Gardner Mountain WSAs could be affected by commercial harvest in the long term (by 2000). Timber harvest would affect the size, naturalness, and opportunities for solitude and primitive recreation in the harvested areas of the WSAs. There is a high probability that this impact would occur because of surface disturbance associated with timber harvest. Wilderness characteristics would be affected for at least 20 years.

Some small impacts associated with range improvement facilities could affect the naturalness of WSAs. These impacts would be associated primarily with the construction and placement of such facilities as reservoirs, fences, and storage tanks. Although the facilities would be visible in some locations, the impacts on naturalness would be minor, and with successful reclamation, the facilities would blend into the surrounding land-

scape. There is a high probability of some small, long-term adverse effect on naturalness from introduction of constructed facilities.

All 28,931 acres in the three WSAs would be available for oil and gas leasing with appropriate stipulations. Because of the low probability of oil and gas discovery in the North Fork and Gardner Mountain WSAs, little development, if any, would be expected.

The probability of discovery of oil and gas is considered high in Fortification Creek, and the associated disturbance would have significant effects on the area's naturalness and on opportunities for solitude and primitive recreation. The probability of such effects occurring is high. The effects would be long term and in some cases might be irreversible because of the limitations of the soils and vegetation in the area.

Providing public access to the Gardner Mountain and North Fork WSAs would result in a small, insignificant impact to the naturalness of the area. Visitor use concentrated in certain areas might cause losses of soils and vegetation, which would impair the area's naturalness. Concentration of use in certain geographical areas also would result in a loss of opportunities for experiencing solitude. The probabilities of these impacts occurring are considered high because of the strong



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demand for access to public land. These impacts would not be long term or irreversible because they could be changed by management policy.

Wildlife improvement and water development projects that might result from activity planning (AMPs and HMPs) would have a small impact on the naturalness of the immediate area. There is a moderate probability of some minor long-term impacts on naturalness from the presence of constructed facilities.

Outstanding opportunities for solitude and primitive recreation would be preserved in Gardner Mountain and North Fork WSAs under this alternative. There is a high probability that Fortification Creek WSA would lose its wilderness characteristics because of the area's high potential for the discovery of oil and gas and the resulting development.

The special features of the North Fork and Gardner Mountain WSAs would be preserved under this alternative. In Fortification Creek the special features associated with deer and elk range could be significantly reduced by large-scale oil and gas development.

The multiple resource benefits that wilderness designation could ensure would not be threatened by this alternative in the Gardner Mountain or North Fork WSA. Primitive recreation and important wildlife habitat in Fortification Creek would be significantly affected by expected oil and gas development.

Expanding the diversity of natural systems within the NWPS would not be accomplished by the addition of Gardner Mountain or North Fork WSA because of the relative abundance of existing wilderness in the ecosystem. Nondesignation of Fortification Creek would prevent the addition of a new ecosystem to the NWPS (see appendix 7).

Adequate opportunities for solitude and primitive recreation are available within a day's drive of major population centers.

Balancing the geographic distribution of wilderness areas would not be accomplished by the designation of any of the three WSAs. Designation will further concentrate the existing situation in Wyoming.

EFFECTS ON WILDLIFE RESOURCES

There would be a short-term beneficial effect on wildlife habitat from prescribed burning of approximately 1,500 acres over the life of the plan. There is a moderate probability that this would provide a diversity of vegetation and increase the edge effect in these areas.

Mitigative measures applied when timber sales are conducted would have a short-term positive effect on wildlife. There would be a low probability of a long-term negative impact on big game from a loss of suitable hiding and foraging habitat adjacent to sale areas. The effect of logging approximately 200 acres per year would depend on the shape and size of the cutting units as well as on their location. Access roads through forested areas would have a short-term adverse impact in that big game would avoid those areas for a distance of approximately $\frac{1}{2}$ mile.

Initiating a timber sale on the basis of access negotiation and market demand rather than according to a ten-year schedule might have a long-term adverse impact on elk and deer habitat by causing a loss of hiding and thermal cover. This potential impact would occur if logging activity was concentrated in one specific area rather than



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dispersed over a larger general area. If forage and hiding cover is limited, elk would displace to areas with suitable forage, cover, and security.

The allocation of 2,400 additional AUMs to big game over the long term would meet the objectives of the WGFD for populations of 3,000 elk, 13,700 mule deer, and 3,920 antelope in 23 "I" allotments.

Improvement of range condition through accepted livestock management techniques and range improvements would have a long-term positive effect on wildlife habitat (70% probability). Water development would allow for improved wildlife and livestock distribution as well as better forage utilization. As a result, production and health of various species would improve.

Site-specific analysis of all range improvement projects and AMPs will be conducted to consider ecosystem management. This would have a long-term positive effect of protecting and enhancing wildlife habitat (high probability).

There would be a slight short-term adverse impact on existing wildlife habitat and populations (low probability) until range improvement and livestock adjustments could be initiated. Big game forage and cover, riparian habitat, and wildlife distribution on approximately 180,000 acres in less than good condition would remain in less than desirable condition.

Restriction of access roads, pipelines, and power lines to corridors would have a slight long-term beneficial effect on wildlife habitat by limiting surface disturbance. Piping oil and gas products out of crucial elk winter areas and placing seasonal restriction on rights-of-way and other realty actions would have a high probability of providing a long-term benefit to wildlife because these restrictions would minimize the stress on wildlife during crucial winter and breeding periods.

Consolidating federal surface and acquiring crucial habitat through exchanges as indicated on map 7 would have a high long-term benefit. Riparian areas, threatened and endangered species habitat, and crucial big game winter range would be protected. "Blocking up" federal surface would give the WGFD better control of wildlife populations through hunting and management and would improve the BLM's ecosystem management through maintenance of essential habitat components such as forage, cover, water, and space. The probability of such benefits occurring is estimated to be high.

A short-term wildlife habitat loss could be caused by mineral material mining and haul road

construction, but it is unlikely to occur. Only about 20 to 30 acres per year would be disturbed.

Seismographic exploration would have a slight short-term impact on approximately 1,000 acres of wildlife habitat; however, the probability of a negative impact to wildlife such as displacement from preferred habitat or stress would be 10% because the period of surface activity would be short.

Oil and gas exploration and development would disturb 1,500 to 2,000 acres per year of wildlife habitat (350 acres public surface). Approximately 40 to 45% of the impacts would be long term. The impacts would be habitat loss, and to a lesser degree, displacement of wildlife by access road traffic and by drilling and production facilities.

The probability of vegetational change from a sagebrush-grassland habitat to a grassland ecosystem on reclaimed sites is estimated to be low. A slight reduction in numbers of big and small game would be expected to result from poaching, traffic accidents, and lower reproduction success due to stress; however, the loss would not be significant.

ORV restrictions on approximately 32,000 acres of crucial elk habitat would prevent damage to the habitat and displacement and stress to elk during essential periods. This would be a slight long-term beneficial effect. ORV activity in these areas is unlikely to occur. This estimate is based on past experience.



Environmental Consequences

The effects on wildlife from the Alternative B restrictions on surface-disturbing activity for erosion control within 500 feet of surface water and in erodible areas would be the same as those described for Alternative A.

Crucial seasonal wildlife habitat would be protected by this alternative. There is a moderate probability that habitat loss, increased physiological stress, and lower reproduction would occur in priority wildlife populations because of the extensive land use now occurring in the resource area. Decisions that would be implemented under this alternative would protect 69,400 acres of habitat (9% of the BLM surface in the resource area) through seasonal restrictions and 8,200 acres (about 1% of the BLM surface in the resource area) through "no surface occupancy" stipulations.

A recommendation not to designate the three WSAs as wilderness, if accepted by Congress, would affect big game habitat in the Fortification Creek WSA because oil and gas exploration and development would have a high probability of occurring. Present wildlife protective stipulations applied to adjacent crucial elk wintering and calving areas and mule deer yearlong habitat would not be sufficient to prevent habitat and population losses through displacement, increased physiological stress during crucial periods, and loss of animals from poaching, vehicle traffic, and improved hunter access. Mitigative measures and protective seasonal restrictions would reduce the probability of such actions; however, the present "no surface occupancy" areas outside the WSA would be surrounded by oil and gas development, roads, and vehicle traffic after removal of the present leasing restrictions in the WSAs.

The chance of oil and gas development and other surface-disturbing activity occurring in the Gardner Mountain and North Fork WSAs is unlikely, and protective restrictions would prevent impacts on wildlife habitat in 80% of the area without wilderness designation.

The cumulative effects of Alternative B on wildlife would be long-term disturbance of approximately 1,000 acres of habitat per year on public lands and effects on the wildlife on 2,000 additional acres. This would be caused by oil and gas development, timber harvest, mineral material disposal, ORV use, and right-of-way construction, which would cause loss of forage, cover and space.

Perhaps the least understood but most crucial habitat component is space. Wild animals require relatively undisturbed areas in which to feed, rest,



and breed. Surface-disturbing activity within these areas has various effects on wildlife, depending on the species' tolerance to disturbance, type, and duration of activity and whether such activity occurs during crucial life cycle periods such as winter and parturition.

One surface-disturbing activity itself may have little effect on wildlife; however, a combination of two or more, or the presence of surface disturbance in a crucial winter range or breeding area, may cause displacement or loss of forage, cover, and space. The result of such disturbance is increased physiological stress from expending energy or not being able to maintain body energy. Lower body health results in winter kill, reduced reproduction, or higher susceptibility to predation, which in turn can reduce population numbers. The ultimate consequence of reducing the amount and quality of wildlife habitat is smaller numbers of wildlife.

Prescribed burns on approximately 1,500 acres over the life of this plan would improve habitat diversity and increase the edge effect (interspersion of habitats). Wildlife also would benefit from restrictions on forestry activities that protect habitat. These benefits would be short term.

Environmental Consequences

Seasonal restrictions placed on land uses would benefit wildlife by preventing disturbance during critical winter and parturition periods for the wildlife. This would be a long-term beneficial effect. Other long-term beneficial effects would result from restrictions of access roads, pipelines, and power lines to corridors and from piping oil and gas products out of critical winter range for elk.

Wildlife also would benefit from prohibition of surface occupancy for oil and gas activity, restrictions on ORV activities on big game winter ranges or elk calving areas, retention of sufficient escape and foraging habitat adjacent to timber cutting units, and exchange or sale of scattered public land parcels so areas could be "blocked up" into manageable units. From past experience it is estimated that the restriction of oil and gas exploration, rights-of-way, and other surface-disturbing activity through wildlife seasonal or "no surface occupancy" provisions are unlikely.

Preparing and implementing HMPs would have a long-term beneficial effect because they would maintain or improve wildlife habitat through on-the-ground improvements or control of other activities.

Intensive rangeland management practices might cause changes in plant communities and the wildlife using them. As ecological condition changed in response to vegetation manipulation on specific areas, some species would be displaced. Grazing systems involving deferred use or resting of certain pastures would help to improve the quantity and quality of wildlife habitat

and provide areas where wildlife did not have to compete with livestock.

There would be little change in elk habitat in "M" and "C" category allotments, but some changes would occur in the long term on "I" category allotments, where long-term changes could be expected to produce more grass and forbs, improving elk foraging areas. It is expected that practices under this alternative would improve the condition of 16,000 acres of critical elk range from less than good to good.

Water development in conjunction with AMP development would enhance wetland habitat and allow rest on overused streams, springs, and reservoirs. This would have a long-term benefit by improving the condition of riparian areas. Deferred grazing or rest would allow grasses, forbs, and woody plants to become reestablished and to stabilize streambanks. Improved wetland and riparian habitat would provide additional habitat for many wildlife species, including threatened and endangered raptors that might use deciduous trees for roosting or nesting or as cover in feeding areas.

A few of the proposed new reservoirs may be built to support game fish where sites are suitable. Fencing wetlands would reduce sedimentation and improve aquatic and riparian vegetation.

Upon nondesignation of the Fortification Creek WSA, the expected oil and gas development would cause a moderate to high long-term impact on wildlife habitat by removing or occupying habitat areas. There would be insignificant impacts in Gardner Mountain and North Fork WSAs.



Environmental Consequences

ALTERNATIVE C

The effects of Alternative C on air resources, soil resources, topography, salable minerals, and socioeconomic conditions would be the same as those described for Alternative A.

The effects on forestry, lands and realty, oil and gas, recreation, vegetation, and wilderness would be the same as those described for Alternative B.

EFFECTS ON CULTURAL RESOURCES

All consequences of Alternative C on cultural resources would be the same as those of Alternative B except for the following.

Alternative C would provide for adequate consideration of cultural resources by ensuring adherence to all laws, regulations, and policies that protect cultural resources. No public benefit would be derived from interpretation of sites. Some adverse impacts to cultural sites could occur as a result of surface-disturbing activities associated with fire, forest, grazing, lands, recreation, minerals, and visual resources management. However, impacts from these programs are only possibilities, and the probability of their occurring is low. In general, the activities proposed by other programs in this alternative would positively benefit cultural resources by leading to the identification of additional sites.

EFFECTS ON LAND USES

Grazing is the only land use that would be affected by Alternative C. The effects of noxious weed control and of fencing of spring seep areas would be the same under this alternative as those described for Alternative A.

Implementation of AMPs would result in a short-term increase in forage production of 3,850 AUMs on 10 to 12 "I" category allotments (from 11,188 AUMs to 15,038 AUMs). In the long term, forage production from all 29 "I" allotments would increase by 15,400 AUMs (from 28,968 to 44,368 AUMs). The increase in forage production would result from construction of range improvements and from improved range condition. All of

the increase in forage production resulting from improved range condition would be licensed for livestock use.

Construction of water developments and cross fences would make more forage available for livestock by improving distribution of use and making most of the grazing land in the allotments available for livestock use. Improved range condition would provide for increased stocking rates because the recommended stocking rates increase as rangeland approaches excellent (climax) condition.

It is expected that range condition would improve by approximately one condition class (fair to good) within ten years following implementation of an AMP. However, the actual rate at which range condition would improve would depend to a large extent on the initial condition of the range and the production potential of the range sites. Range condition would improve most rapidly on the more productive range sites and on areas that were initially in fair or better range condition. A slower rate of improvement would be expected on poor condition ranges or on areas dominated by low production range sites.

Intensive grazing management systems implemented in conjunction with AMPs would contribute to improved range condition by providing for replenishment of plant root carbohydrate reserves, seed production, seedling establishment, and scattering and trampling (planting) of seed. Range improvements and grazing treatments associated with this type of management also would provide for a proper forage use level of 40 to 60% of the current year's growth and for better distribution of livestock grazing. Improved distribution of livestock would ensure that the range would be grazed evenly rather than being overused in some areas and little used in others.

No current information is available regarding range condition except for approximately 45,000 acres inventoried in 1983. On the basis of projections from this survey, it is estimated that short-term and long-term changes in range condition would occur as shown in table 4-3. The probability of the identified impacts occurring is estimated to be moderate. The estimate is based on professional judgment.

Construction of range improvement facilities would result in short-term surface disturbance of 300 to 400 acres over the ten-year life of this plan.

Environmental Consequences

Consequently, a short-term loss of approximately 60 AUMs would occur on 20 to 25 grazing leases. A long-term reduction of 10 AUMs in livestock forage would occur on 50 acres as a result of occupancy of the surface by range improvement facilities and concentrated livestock use in the immediate vicinity of 120 water facilities. The probability of these effects occurring is estimated to be low. The estimate is based on past experience in the resource area and professional judgment.

The cumulative effects on grazing from actions proposed under Alternative C would be the same as those described for Alternative B, except that actions proposed in the grazing management program would change the short-term and long-term licensed use levels for livestock.

Actions proposed under the grazing management program for Alternative C would result in a short-term increase of 3,850 AUMs on approximately 130,000 acres in 10 to 12 grazing allotments. An increase of 15,600 AUMs on 273,292 acres in 30 to 35 allotments would be expected in the long term.

EFFECTS ON MINERAL RESOURCES

Effects on Coal

About 109 billion tons of uncommitted coal would be available to meet future demand under this alternative. About 12 billion tons is contained in PRLAs and delineated coal tracts. About 103 billion tons would be available for future competitive leasing. The alternative would allow maximum availability of federal coal lands that would meet any projected leasing levels. The likelihood of leasing this much coal is low, but the opportunity to respond to competitive and noncompetitive needs would be very high.

The alternative would allow leasing pending delineation of a tract when an expression of interest has been filed. Such a provision harbors many potential problems that can be created by developing coal in sensitive areas. These problems are discussed in Alternative A.

Effects on Oil and Gas

Leasing federal oil and gas without any restriction, irrespective of which lands contain committed federal coal, would be beneficial in some cases and adverse in others. Conflicts would be worked out between the oil and gas and coal lessee without interference of various federal restrictions.

The probability that one resource would be developed to the detriment of the other would increase. For example, an oil and gas well might be placed in line with a surface mine. The outcome probably would be litigation or removing the well site, plugging the well, and attempting to reproduce the well after surface mining was complete. In some cases flow would be lost and the oil well would not be as productive as before, or production could not be reestablished. Should that occur, that loss would be irreversible.

There does not appear to be any sufficient reason to allow these types of conflicts to occur when development of both resources could occur without either significantly affecting the other.



Environmental Consequences

EFFECTS ON VISUAL RESOURCES

The effects on visual resources from the lands and realty, minerals, and recreation programs under Alternative C would be the same as those of Alternative A, except for the following:

Permitting surface-disturbing activities on North Middle Pumpkin Butte and within 200 feet of state and federal highways would cause long-term negative effect by altering the natural lines of the landscape. It is unlikely that long-term moderate visual effects will occur in areas near highways from activities such as development of oil and gas or minerals. There is a high probability of some form of surface disturbance on the butte such as a communication site or oil and gas exploration activity because these activities are present in the surrounding area. The effects would be neither irreversible nor irretrievable.

The effects on visual resources from the cultural resources, forestry, grazing, and wilderness programs under Alternative C would be the same as those of Alternative B.

EFFECTS ON WATER RESOURCES

The effects on water resources under Alternative C would be the same as those described for Alternative A from the management of cultural resources, lands and realty, minerals, recreation, wildlife, and soil, air, and water.

The effects on water resources from the wilderness, grazing, forestry, and fire programs under Alternative C would be the same as those of Alternative B.

EFFECTS ON WILDLIFE RESOURCES

Big game population numbers under Alternative C would be the same as under Alternative A for the short term and the long term. WGFD strategic

plan objectives would not be met because any additional forage produced would be allocated to livestock production.

Range management systems that favor management of livestock in crucial elk habitat areas (10,000 acres) would result in a long-term decrease in elk numbers. The lower elk numbers would result from development of livestock facilities on public land and resultant increases in forage utilization by livestock in crucial elk winter ranges. There is a moderate probability that this would cause forage competition between livestock and elk and, subsequently, insufficient forage for present wintering elk numbers. As a result, there is a low probability of elk numbers decreasing over the long term. The condition of riparian habitat would decline over the long term because riparian areas would be heavily used by the increased numbers of livestock.

Allowing surface occupancy in crucial habitat for big game, upland game, and bald eagles would cause displacement of these species from their traditional use areas during essential periods of their life cycles. The loss of habitat would result in lowered numbers. Depending on the extent of habitat loss, this long-term unavoidable adverse impact could be irretrievable. The probability of its occurring is low.

Crucial wildlife habitat would not be adequately protected from surface-disturbing activities such as pipelines, rights-of-way, and oil and gas exploration and development. These types of activities would displace wildlife from crucial winter and breeding areas, lowering herd health and reproduction. This would have a high impact on resident populations of high interest wildlife species over the long term. The probability of this impact occurring is moderate.

Cumulative impacts on wildlife under Alternative C would be a continued decline in wildlife habitat, which is in less than good condition on the "I" allotments. Consequently, habitat diversity and condition would decline, as would the variety and numbers of wildlife. The result would be an unbalanced ecosystem with wildlife populations smaller than desirable for consumptive and nonconsumptive public use. Big game population objectives established by the WGFD would not be met under this alternative. The probability of such long-term irreversible effects occurring is high. This would be an unavoidable adverse impact.

Environmental Consequences

ALTERNATIVE D

The effects of Alternative D on air resources, topography, salable minerals, and socioeconomic conditions would be the same as those of Alternative A.

The effects of Alternative D on cultural resources, lands and realty, coal, and vegetation would be the same as those described for Alternative B.

EFFECTS ON LAND USES

Effects on Forestry

Approximately 36,300 acres of commercial forestland would be included in the forest management base. This figure represents a 3,654-acre reduction resulting from recommendation for wilderness designation. Therefore, under Alternative D the forestry program would offer approximately 7 MMBF of green timber over the next ten years.

Removal of about 3,650 acres of commercial forestland from the harvestable base because of wilderness recommendation would reduce the timber harvest by about 2 MMBF.

Acquisition of easements for forestry purposes and implementation of forest development projects to support the proposed harvest would benefit the forestry program. Other decisions of beneficial consequence to forest management would be the use of prescribed burns for forest site preparation and adjustments or suspension of livestock grazing where such activity adversely affects the commercial forestlands. These beneficial effects would improve growing conditions in the short term and in the long term would lead to increases in the annual timber sale offerings.

The only surface-disturbing activity that could result in an unavoidable adverse impact to commercial forestlands would be oil and gas development. The chance that oil and gas development would occur on commercial forestlands in the south Big Horns in the short term is minimal. In the long term, the probability of occurrence would increase. The effects would be the same as those of Alternative A.

The cumulative effects of Alternative D on forestry would be the reduction of timber sale offerings to

approximately 70 MMBF of green timber during a period of increasing demand for timber.

Effects on Grazing

The effects of Alternative D on livestock grazing would be the same as those described for Alternative B except for the grazing management and wilderness programs.

The effects of noxious weed control and fencing of spring seep areas would be the same under this alternative as those described for Alternative B.

Reduction of livestock grazing use by 8,800 AUMs (from 28,968 AUMs to 20,168 AUMs) on 29 "I" category allotments would necessitate substantial adjustment in grazing management operations for at least 20 operators. These operators would be forced either to reduce their herd size to accommodate the reduced authorized use level on the public land or to locate alternative sources of forage for the displaced stock.

Under Alternative D, the range condition of the "M" and "C" allotments would improve as described for Alternative B. Improvement in range condition on the "I" allotments would be expected to occur gradually as a result of reduced utilization of forage plants. Projected changes in range condition on the "I" allotments are shown on table 4-5.

The estimates of changes in range condition under this alternative are based on professional judgment. The probability of the identified impacts occurring as described is estimated to be low. The long-term loss of livestock production resulting from reducing grazing use by 8,800 AUMs would be an unavoidable adverse impact.

A recommendation to designate the three WSAs as wilderness would result in increased livestock management costs to nine operators who hold grazing leases inside the WSA boundaries. The increased costs of operation would result from the exclusion of motor vehicle use for normal management operations such as fence maintenance and stock gathering. Of the nine operators potentially affected by the wilderness designation, six have significant portions of their grazing leases in the WSA. Consequently, these operators would have to make substantial adjustments in their management practices and possibly in the use of the wilderness portions of their leases.

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TABLE 4-5
CHANGES IN RANGE CONDITION
UNDER ALTERNATIVE D

Allotment Category	Estimated Acreage of Present Condition		Projected Acreage of Short-term Condition		Projected Acreage of Long-term Condition	
	Poor and Fair	Good and Excellent	Poor and Fair	Good and Excellent	Poor and Fair	Good and Excellent
Maintain	53,455	267,526	40,090	280,891	30,068	290,913
Improve	71,056	202,236	40,056	233,236	25,056	248,236
Custodial	36,516	103,930	32,516	107,930	28,516	111,930

The probability of the impacts occurring is estimated to be moderate. The estimate is based on professional judgment.

The cumulative effects on livestock grazing from actions proposed under Alternative D would be the same as those described for Alternative B except that actions proposed in the grazing management program would change the short-term and long-term levels of authorized use. Wilderness designation would add to the costs of livestock operations within the WSAs.

The livestock reductions proposed under this alternative would bring the total short-term loss of livestock forage on public land surface to 9,900 AUMs. A total of 6,400 AUMs would be restored after range condition objectives were achieved. The long-term loss of livestock forage would be 2,780 AUMs.

Effects on Recreation

Under Alternative D, all programs but the recreation management program would have the same effects on recreation as those of Alternative A. The recreation management program of Alternative D would have the same effects as the recreation management program of Alternative B, except that primitive recreation opportunities would be affected as described below.

Primitive recreation opportunities would be preserved on 28,931 acres if Congress accepted the recommendation to designate all three WSAs as wilderness. Development of public access to the WSAs also would provide access to other public lands. These other lands adjacent to the WSAs or to the access route total approximately 51,000 acres. This impact is considered highly probable because of the high demand for access

to public land and available hunting areas. These effects on recreation would be positive, moderate, and long term.

EFFECTS ON MINERAL RESOURCES

The effects of Alternative D on oil and gas would be the same as those of Alternative B, except for the following.

A long-term adverse effect on oil and gas development could result from a policy of considering land sales or exchanges case by case according to whether the areas are in KGs or have coal development potential, or whether designated mineral material sites would be affected by the action. The effects would consist of added expenses for surface damage fees that would probably be required by the new surface owners (high probability). Possible costs of such fees are listed in the "Oil and Gas" section of Alternative A. There are no rental charges to the oil and gas companies for use of federal lands on the same oil and gas lease as the well, or within a producing unit.

A wilderness designation, if Congress authorized it, would remove 28,931 acres of potential oil and gas reserves from leasing. This would be a long-term, irreversible impact. The federal oil and gas reserves could not be developed, even from outside the wilderness areas. Oil and gas resources might then be drained from wells on adjacent state or privately owned minerals, an irretrievable adverse impact. Assuming that drainage could occur $\frac{1}{4}$ mile from wells on private minerals, there would be a potential for drainage of federal oil and gas from the following approximate acreages:

Environmental Consequences

Fortification Creek, 2,800 acres; Gardner Mountain, 7,000 acres; and North Fork, 2,600 acres. This would be a long-term impact.

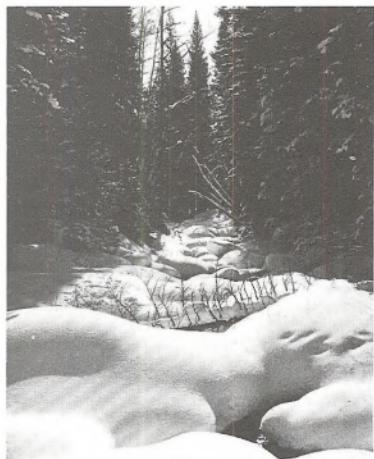
The cumulative effects of Alternative D on oil and gas would include possible loss of oil and gas resources in the WSAs and added expenses for oil and gas development if these activities were not fully considered when land surface was sold or exchanged.

There would be a potential for drainage of approximately 12,000 acres of federally reserved oil and gas by wells that could be drilled on state or private minerals.

EFFECTS ON SOIL RESOURCES

The effects of Alternative D on soil resources would be the same as those described for Alternative A, except for the following.

Harvesting wood products from commercial forestlands would entail the same types of impacts discussed for Alternative A. However, the impacts would be significantly fewer because harvest is generally limited to posts, poles, and firewood.



Courtesy of Wyoming Game and Fish Department

This type of harvest requires minimal construction of roads, skid trails, and landings, or sometimes none. No significant impacts on soils would be expected.

The effects on soils from grazing management under Alternative D would be the same as those of Alternative B, except for the following.

High erosion susceptibility on 30,000 acres would be reduced in the long term by improvement of range condition from unsatisfactory to satisfactory. Selected improvements in this area would be directed at resting pastures and adding new water sources to promote better livestock distribution. In the long term, a 20 to 40% reduction in erosion rates would be expected.

Wilderness designation would have a beneficial effect on soils since most surface-disturbing activities would be prohibited. Prohibition of surface disturbance would be especially beneficial in the Fortification Creek WSA because the probability of oil and gas development is high.

EFFECTS ON VISUAL RESOURCES

The effects of Alternative D on visual resources would be the same as those of Alternative A, except that effects on recreation would be the same as those of Alternative B, and the following.

Wilderness designation of the three WSAs would afford the lands within the WSAs the highest level of visual protection, Class I. This class provides primarily for natural ecological changes and some very limited management activity. Designation would result in a strong positive long-term effect on the visual resources on 28,931 acres. There is a high probability that this effect would occur if Congress designated the areas wilderness, because visual protection is included in wilderness policy.

The cumulative effect of the adoption of Alternative D would be less damage to the visual resource base than would occur under other alternatives.

The visual resource would be degraded by the development of oil and gas, coal, and lands and realty resources. Timber and grazing resource development would have a lesser negative impact on the visual resource. ORV designation and restriction of surface development of 31,257 acres of significant cultural sites would preserve the

Environmental Consequences

visual integrity of the area. Wilderness designation of the three WSAs would ensure the preservation of natural appearance of 28,931 acres, resulting in a strong positive long-term effect.

EFFECTS ON WATER RESOURCES

The effects of Alternative D on water resources from the fire, forestry, minerals, and soil, air, and water programs would be the same as those of Alternative A.

The effects on water resources from the cultural, lands and realty, and recreation programs would be the same as those of Alternative B.

The potential for accelerated erosion would be reduced on 30,000 acres of rangeland over the long term because of grazing management actions. A reduction in erosion would result in a long-term improvement in water quality.

Wilderness designation, if approved, would benefit water resources by precluding surface development on about 28,931 acres.

EFFECTS ON WILDERNESS

The effects of Alternative D on wilderness would be the same as those of Alternative B except for the following.

Interim fire management plans would be adopted under this alternative. There is a moderate probability of some impact on the naturalness of the WSAs from the use of mechanized equipment in efforts to control large fires.

Water development projects for range improvement might have a small effect on the naturalness of the immediate area. There is a moderate probability that some minor long-term impacts to naturalness would result from the presence of constructed facilities.

The wilderness characteristics, special features, and multiple resource benefits under this alterna-

tive would be offered maximum protection by wilderness designation.

The diversity of natural systems within the NWPS would be increased by the addition of the Sagebrush Steppe ecosystem of the Fortification Creek WSA. The addition of Gardner Mountain and North Fork would not affect the diversity of natural systems.

Designation of the three WSAs as wilderness would increase the opportunities for primitive recreation from three major population centers—Casper, Billings, and Rapid City. However, there already is a substantial amount of wilderness acreage available in the region. The Regional Wilderness map shows the wilderness areas and WSAs within a 250-mile radius of each of the three WSAs.

Appendix 7 discusses the effects of this alternative on wilderness in more detail.

EFFECTS ON WILDLIFE RESOURCES

The effects of Alternative D on wildlife habitat would be the same as those of Alternative B, except for the following.

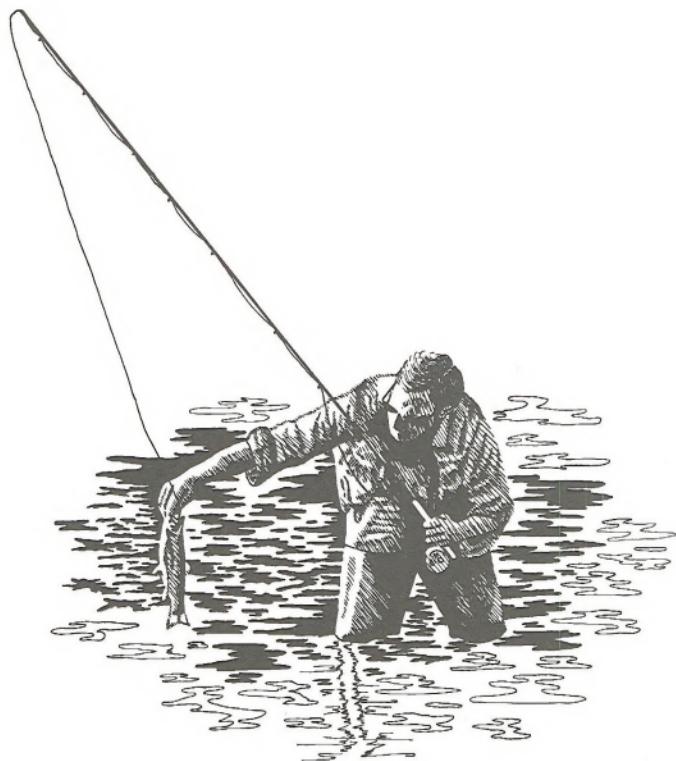
A total of 6,400 AUMs would be available in the short term besides the forage necessary to sustain big game population objective levels in the 23 "I" category allotments. In the long term, any additional forage would be used to increase big game population levels above the WGFD strategic plan objectives. The probability of this occurring is 10 to 20%, as big game levels are set according to the most recent WGFD strategic plan.

Wilderness designation would provide 28,931 acres of basically undisturbed wildlife habitat. This would be a long-term benefit to wildlife and specifically to big game, since the three WSAs contain habitat essential to these animals. For the Fortification Creek WSA, there is a high probability that this effect would occur. For Gardner Mountain and North Fork WSAs, there would be a 30 to 40% probability of long-term benefits to wildlife habitat. This is because surface-disturbing activities probably would not occur in those areas.

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Chapter Five

Coordination, Consistency and Public Involvement



CONSULTATION AND PUBLIC INPUT

CONSULTATION AND COORDINATION DURING PREPARATION OF THE RMP/EIS

First Draft RMP/EIS

Preparation

A *Federal Register* notice, a news release, and legal notices in four Wyoming newspapers in February 1982 announced the initiation of the RMP and EIS, inviting comment and soliciting suggestions and input on issues to be discussed and analyzed.

During the RMP/EIS scoping process more than 500 letters were sent to a wide variety of agencies, organizations, interest groups, and individuals. The letters, which were mailed in the spring of 1982, were intended to solicit comments, suggestions, and opinions concerning issues to be discussed and analyzed in the RMP/EIS.

Approximately 70 meetings of small groups or "one on one" meetings were held with local officials, lessees, landowners, businesses, organizations, and interest groups.

The input received as a result of these public involvement efforts was used in the development of the issues, planning criteria, and alternatives presented in this document. Individual follow-up letters were sent to many persons who requested more information on the process.

Sessions also were held with the District Grazing Board and the District Multiple Use Advisory Council during the planning effort. The board was invited to comment and provide input throughout the planning process.

Public Response

A public hearing was held on the draft document in Buffalo on June 21, 1983. Eight individuals attended, in addition to BLM personnel. Oral responses were given by three individuals: Darrel Romain, John Ahern, and Wallace D. Ramsbottom. Mr. Ramsbottom followed up with written comments. Thirty-one written responses were received, as follows: 4 responses from 3 federal agencies, 15 responses from 13 state agencies (all but 2 through the governor's office via the State Clearinghouse), 3 responses from industry, 3 responses representing special interest groups, and 6 responses from individuals.

Proposed Second Draft RMP/EIS

A notice of intent to prepare a repropose draft RMP and EIS was published in the *Federal Register* on December 16, 1983. Comments were received until January 30, 1984. Six written responses were received in that period. Four responses were related to issues or concerns and these paralleled earlier concerns raised by the same parties. The concerns expressed were related to the gathering of information to evaluate energy and mineral resource potential and the development of land use allocation in areas of high mineral potential. The other responses were requests to be placed on the RMP/EIS mailing list.

CONSISTENCY WITH OTHER PLANS

Meetings were held with the county planners or county commissioners in the three counties in the Buffalo Resource Area. All indicated there were no conflicts with county plans.

BLM personnel met with personnel from the Bighorn National Forest and the Thunder Basin National Grassland to ensure coordination of planning efforts. The Soil Conservation Service, the Fish and Wildlife Service, and the Environmental Protection Agency were consulted through meetings and formally invited to comment by letter. The state of Wyoming and individual state agencies were contacted both formally and informally.

ONGOING PUBLIC PARTICIPATION

The public will have a continuing opportunity to participate in the RMP/EIS process, including the wilderness study aspects. A public meeting and formal hearing on wilderness will be held. Written comments are requested from those reviewing this document. Oral and written comments will be accepted at the public hearing. All comments will be recorded and, when applicable, incorporated into the final RMP/EIS.

A complete record of public involvement activities, correspondence, and comment on the RMP/EIS is on file in the Buffalo Resource Area office.

DISTRIBUTION AND COMMENTS RECEIVED

COMMENTS RECEIVED ON FIRST DRAFT

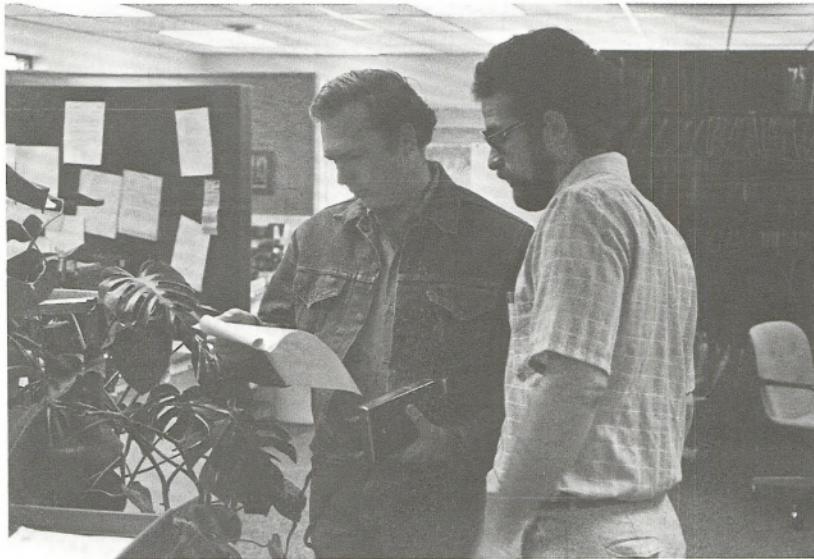
Response to the draft document was as follows (see table 5-1 for summary).

Issues

One comment related to the insufficient justification for rejection of a number of identified issues. Appendix 1 contains more detailed information than was contained in the first draft.

Alternatives

Eight comments were made on the alternatives chapter. One person who commented agreed with the choice of Alternative 2 as the preferred alternative, one opted for Alternative 1, one for Alternative 4, and one suggested a mix of alternatives 2 and 3 so that both livestock and wildlife could benefit from increased forage production. One comment suggested that the arguments presented for delineation of Alternative 2 as the preferred alternative were insufficient. One comment suggested that dividing available critical elk winter range equally between elk and livestock would not necessarily amount to a "balanced" alternative.



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TABLE 5-1
SUMMARY TABLE OF PUBLIC COMMENTS ON
FIRST DRAFT BUFFALO RMP/EIS

Document Section or Topic Area	Comments From					Total Comments
	Individuals	Industry	Special Interests	State	Federal	
Issues	--	--	1	--	--	1 = 1
Alternatives	1	--	2	3 (1)*	1	7 (1)= 8
Environmental Consequences	--	--	--	3 (2)	2	5 (2)= 7
Coordination/Consistency	1	--	--	--	--	1 = 1
Cultural Resources	--	--	--	1	--	1 = 1
Economics	--	--	(1)	3	--	3 (1)= 4
Fire Management	--	--	--	3	--	3 = 3
Forestry	1	--	--	4 (2)	1	6 (2)= 8
Geology	--	--	--	1	--	1 = 1
Grazing	(2)	--	10	(3)	--	10 (5)= 15
Lands and Realty	2	--	1	7 (9)	--	10 (9)= 19
Minerals Management (General)	--		4	--	--	4 = 4
Oil and Gas	11	9	--	1	1	22 = 22
Coal	--	--	1	3 (1)	(1)	4 (2)= 6
Recreation Management	--	--	--	4	--	4 = 4
Sociology	2	--	--	--	--	2 = 2
Water Resources	1	--	3	5 (1)	2	11 (1)= 12
Wilderness	5	--	2	6	4	17 = 17
Wildlife	2	--	1 (1)	15	8	26 (1)= 27
Appendix	--	--	--	--	1	1 = 1
	26 (2)	9	25 (2)	59 (19)	20 (1)	139(24)=163
	28	9	27	78	21	

The entire "Alternatives" chapter, as rewritten for this second draft, contains greater detail for improved clarity.

One comment suggested that the effects of development of the extractive industries on population, income, and employment be discussed in the "Alternatives" chapter. The discussion has been included, but it appears in chapter 4, "Environmental Consequences."

Environmental Consequences

Seven comments on the "Environmental Consequences" chapter were received, all from state and federal agencies. All comments addressed the content adequacy of the consequences section. Two comments indicated that the cumulative impacts were not addressed, and one expressed an opinion that mitigative measures should be included.

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The entire chapter on environmental consequences has been rewritten; the new chapter 4 includes cumulative impacts.

One comment suggested that a section be included to detail the required federal measures designed to reduce environmental impacts for each activity. These measures are outlined in the selected resource management plan and any subsequent site-specific environmental analysis that will be prepared before an action is authorized.

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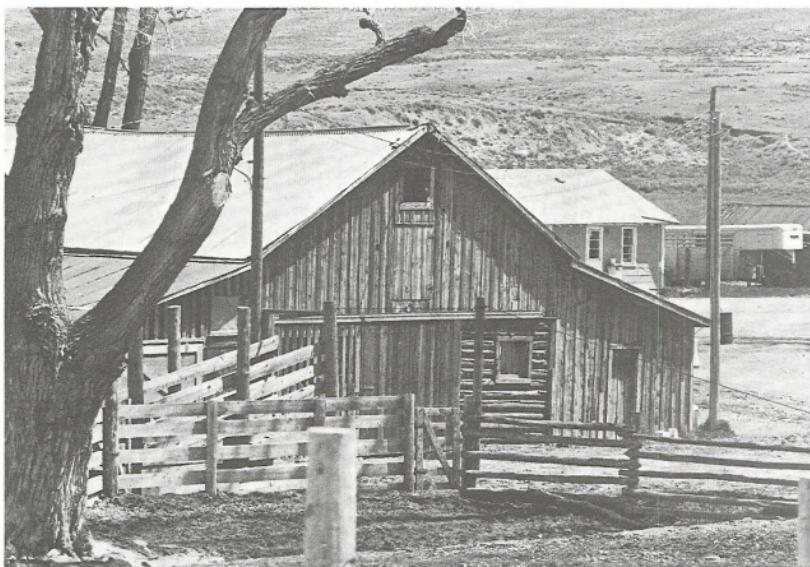
One comment addressed the "Coordination and Consistency" section. An advisory board member did not remember being asked to comment on the planning process. A review of the board minutes reveals that members were asked to comment at various planning stages.

Cultural Resources

One comment suggested the use of recently assimilated cultural data. This information is incorporated into the sections of this document that deal with cultural resources.

Economics

Four comments were received on the "Economics" sections of the draft. One suggested that coal miners could be employed in Johnson County by 1990-1995. This information was noted in this draft. One comment suggested that cost/benefit analysis should be included for all expected impacts for all programs. Another suggested that economic tradeoffs for each program be described. The economic impacts of the alternatives are



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described in chapter 4 in the "Socioeconomic Conditions" section. Changes have been made in the "Economics" sections on the basis of the above comments and the new alternatives.

Fire Management

Three comments from the state of Wyoming dealt with fire: inclusion of a fire class map was suggested; the state indicated that exclusion of heavy equipment for fire suppression could jeopardize nonfederal lands; and a third comment suggested that a close liaison be maintained with the Johnson County fire warden.

The suggested fire class map (map 10) appears in this draft. The second comment is accommodated through use of a resource area advisor on all fires in environmentally sensitive areas. The advisor would make a determination on any sensitive values and make recommendations on use of heavy equipment. The suggested liaison with Johnson County is a standard practice in the resource area.

Forestry

Eight comments received on the forestry sections of the draft RMP/EIS made the following suggestions:

Consider some areas strictly for clearcuts and some strictly for grazing.

Do not log in areas of severe erosion hazard.

Define by legal description the state lands needed for access as well as sale areas.

Discuss why there are no plans for timber stand improvement and why no measures have been mentioned that would mitigate the impacts of harvesting on steep slopes.

Clarify the differences between the annual sustained yield and the annual allowable cut.

Evaluate wildlife impacts from timber harvesting on a site-specific basis.

The North Fork WSA might become a feeder area to surrounding ownerships for increasing forest insect infestations and fires.

The BLM manages the public forestlands under the principle of multiple use. Therefore, livestock grazing is authorized on timber harvest areas, but only when it will not impair the productive capacity of the forestlands. In the past livestock have

browsed and trampled the new tree seedlings that became established following a timber harvest, preventing these areas from becoming reforested.

An environmental assessment, which includes an analysis of soil erosion potential, is prepared before any timber sale is approved. Timber sales will not be conducted on areas of severe erosion hazard unless mitigating measures can be successfully applied that would prevent such erosion from occurring.

The legal description of all lands (including state lands) where access will be acquired for forest management purposes has been included in appendix 4. Timber stand improvement projects are now included in the plan. Site specific timber sale plans will include measures to mitigate impacts associated with harvesting timber on steeper slopes. No sales on slopes of more than 40% have been scheduled during the next ten years.

The full annual sustained yield capability estimate was based solely on forest management decisions, assumptions, and site productivity. The annual allowable cut represents the reduced yield based upon the incorporation of certain multiple use restrictions and operational factors that affect a harvest level.

Site-specific environmental assessments/timber sale plans are routinely prepared for all proposed timber sales. Such documents address effects of timber harvesting on wildlife and prescribe measures to mitigate those effects.

Fire and insect control measures will be applied to the North Fork WSA so that adverse conditions will not spread to adjacent private and state lands.

Geology

One comment was received from the state that suggested inclusion of a section on geologic hazards. Such a section is included in the second draft in the "Geology" section of chapter 2.

Grazing

Comments Received

Fifteen comments were received on grazing, of which four came from the Wyoming Farm Bureau, one from the Powder River Basin Resource Council, five from the Natural Resources Defense

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Council, three from the Wyoming Game and Fish Department, and two from individuals. The comments contained the following suggestions, questions, and observations.

Consider some areas strictly for timber clear-cuts and some strictly for grazing.

Wildlife increases on public lands may make it necessary for landowners to intensify domestic animal production on private lands to offset grazing losses on public lands. If this happens, wildlife will suffer because less forage would be available for them on private lands.

The draft addresses neither the economic impacts of reducing livestock grazing on crucial elk range on private lands nor mitigating measures for that effect.

Has BLM erroneously concluded that only livestock cause erosion?

What does BLM propose to do with increased "plant cover, plant community structure, and plant health" that would result from reduced use and with improved wetland and riparian areas that would result from "improved management, placement of range improvements and supervision of use"?

The draft contains no breakdown for particular allotments on range condition, no estimates of current or potential grazing capacity, and no site-specific data on soils and vegetation.

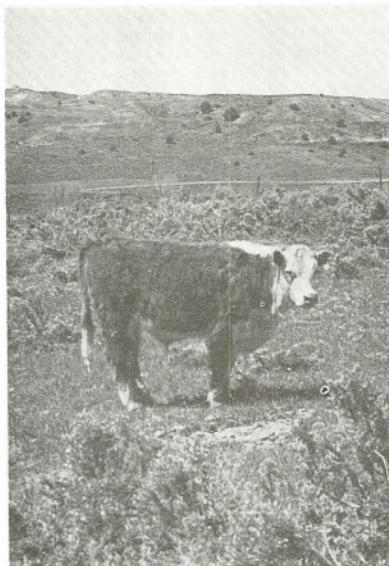
The BLM's failure to conduct "baseline inventories and rangeland monitoring studies" before completion of the EIS is contrary to legal requirements.

There are no alternatives that include the actual terms and conditions for each allotment under which grazing will be allowed. The numbers of livestock, seasons of use, maximum allowable utilization levels, and grazing systems should be included.

The EIS lacks any grazing alternatives or any proposals to protect and improve resource conditions, although half of the resource area is in unsatisfactory condition.

There is no evidence to support the statement that range condition would be expected to improve.

Proper control of livestock destruction in the Middle Fork Management Area is a serious problem, as grazing may be adversely affecting crucial winter and summer wildlife ranges.



Wildlife data should be included in the baseline inventories that are conducted before AMP development.

Reservoir construction would not necessarily improve wildlife habitat conditions.

Discussion

Forest management decisions that address exclusion or adjustment of livestock use on timber harvest areas and certain commercial forest sites in essence allocate the use of these sites to timber production rather than to livestock production. No lands are specifically allocated to grazing use over timber production; however, grazing use of most of the forestlands would continue under all alternatives except where site-specific conflicts have been identified.

Wildlife population levels are established by the WGFD. The land use goal under the preferred alternative is to provide forage on public land to meet demand of the WGFD objective population.

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This would be accomplished through improved range condition and management rather than by reducing livestock use. Under Alternative C, no additional forage would be available for wildlife use; thus, populations would not be expected to increase. Alternative D calls for livestock reduction to provide additional forage to wildlife. The effects of these actions on livestock operators are evaluated in the document.



None of the alternatives propose actions on lands that are not administered by BLM; thus, the fact that the consequences of non-BLM actions are not addressed is not considered unreasonable.

An alternative considering "across the board" deferment of livestock use to address soil erosion on critical watersheds was not developed or analyzed in this document. Increased plant production cover, improved vigor, and stable community structure result from improved range condition. These improvements are not themselves allocated to any use; however, they may be indicators of progress toward meeting resource management objectives, including production of livestock forage, restoration of unsatisfactory range condition, and reduction of soil erosion.

The only available current allotment-specific information on range condition and potential is that from the three allotments inventoried in 1983.

Chapter 3 presents data on range condition from the 1949-54 and 1968 MRB surveys, the forage condition survey, and the 1983 inventory. The RMP/EIS was prepared with the use of existing data. Allotment-specific inventories and monitoring studies will be initiated before or in conjunction with the development of AMPs.

Appendix 6 of this draft shows the allotment number, name, acreage, number and kind of livestock, AUMs, and management category of each allotment in the resource area. The maximum allowable levels of forage utilization and the grazing systems to be applied will be determined in conjunction with AMP development.

Three alternatives were developed and analyzed that addressed the grazing issue of unsatisfactory range condition and lack of wildlife forage on the "I" category allotments.

Chapter 3 presents information from range condition inventories conducted at various times from 1949 through 1983. Data from these inventories indicate a strong trend toward improving range condition on public land.

Two of the allotments in the Middle Fork area are in the high priority "I" (improve) category. AMPs for these allotments will be developed after the RMP is completed. The allotment plans will address site-specific resource problems, including livestock distribution and forage reserves for wildlife use on crucial wildlife range.

Current policy requires consultation, coordination, and cooperation with all affected parties or interests in establishing baseline and monitoring studies and development of AMPs. When wildlife management objectives can be accomplished through livestock grazing management, these objectives will be considered. Actions necessary to accomplish specific wildlife objectives will be implemented in conjunction with the AMPs.

Lack of water has been identified as a limiting factor for wildlife populations on public land in the Powder River Breaks and portions of the south Big Horn Mountains. Development of water supplies in these areas generally would benefit wildlife as well as livestock. The magnitude of the benefit to wildlife on a given allotment would depend on water availability in that area. Water developments on some allotments would significantly benefit wildlife while on the other allotments only minor benefits would be realized.

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Lands and Realty

Disposal

Nineteen comments were received on the "Lands and Realty" sections of the draft, 16 of them from the state. The following comments were made on land disposals:

Significant impacts to wildlife could occur if some small tracts to be disposed of were in critical winter range.

Tracts adjacent to the Bighorn National Forest should be transferred to the Forest Service.

Those who commented were concerned about a change in land use from livestock and wildlife to summer home development or other development incompatible with elk winter and yearlong habitat use.

The BLM should keep tracts containing game habitat or habitat for threatened and endangered species, tracts with public access, tracts with unique habitat values (aquatic, riparian, rimrock).

The BLM should keep tracts with streams classed I, II, or III fisheries and tracts with reservoirs and lakes that support fisheries and have public access.

The BLM should not dispose of lands along the South Fork of Red Fork of the Powder River (T44N, R85W, sec. 32 SE $\frac{1}{4}$ SE $\frac{1}{4}$ and T43N, R85W, sec. 20, NW $\frac{1}{4}$ NW $\frac{1}{4}$, sec. 17, W $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{4}$ SW $\frac{1}{4}$), which should be kept for elk habitat.

What is the proposed plan is for lands disposal; that is, will the restrictions on selling over high-moderate coal be removed? What is being done to protect existing lease holders? Are exchanges being pursued?

The BLM should arrange for exchanges rather than sales.

Land sales could affect outdoor recreation.

Acreage for disposal should be identified, and the objectives, methods, critical, priorities, and impacts of disposal must be discussed.

Small tracts in critical winter ranges will not be considered for disposal, nor will tracts in critical and crucial elk range. The selection criteria for lands for disposal call for consideration of other resource values. Each tract will be examined for special values before it is considered for sale.

Exchanges are not precluded by the disposal criteria and will be used when appropriate. Tracts identified for disposal are shown on map 6. The potential impacts of disposal are addressed in chapter 4.

The Forest Service has been approached regarding exchange of BLM-administered tracts adjacent to the Bighorn National Forest, but at this time the Forest Service is not interested in the tracts.

Access

The following comments were made with regard to access:

Specific plans for acquiring recreational access should be developed.

Has adequate access to the North Fork WSA been obtained?

What is the economic impact of condemnation of access on specific ranch units?

Who would be responsible if the inability to gain access from the Barnum-Kaycee side of the Big Horns resulted in personal tragedy?

Access to the three WSAs is discussed in appendix 7. The impacts of condemnation for access on specific ranch units would be isolated situations. No condemnation is foreseen, and if it should be implemented, an environmental assessment would be prepared. The question of access from the Barnum-Kaycee side of the Big Horns is beyond the jurisdiction of the BLM.

Corridors

Four comments on utility corridors were made, as follows:

Corridor criteria should recognize "people corridors" with constraints different from those used for "product corridors".

The "compatible distance" between utilities in the same corridor should be great enough to permit expansion and modernization.

EIS should address future growth of the electric distribution systems or the future construction of electric transmission lines and oil, gas, and water pipelines in the area.

The stated management criteria would not restrict the planning of any future extra high voltage transmission facilities in the resource area.

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These comments are addressed under Alternative B, the preferred alternative, in chapter 2 of this document.

Minerals Management

General

The Natural Resources Defense Council made four comments on minerals management, as follows:

Coal, oil and gas must be addressed in the document rather than by reference to existing plans.

The document does not review existing planning and does not ensure that future leasing of coal and of oil and gas will be conducted pursuant to legal requirements.

The document precludes any public comment on proposed planning activities for coal and for oil and gas.

Existing plans are not comprehensive and do not satisfy legal requirements, and the BLM cannot proceed with actions on 20 coal tracts now being ranked for leasing.

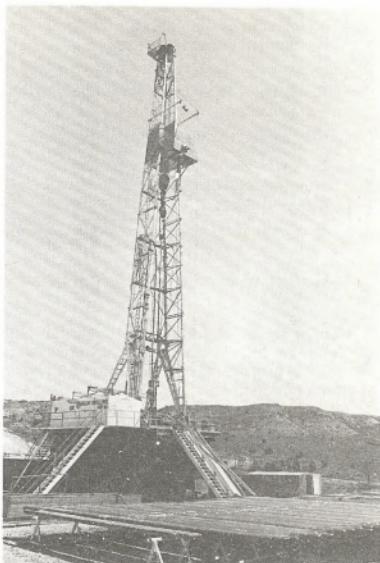
This draft contains detailed discussion of the coal and oil and gas programs and resources. All planning and mineral leasing is conducted according to existing laws, regulations, and policies. All issues, resources, and programs, including coal and oil and gas, are open to public response and comment.

Existing comprehensive plans cover all programs, activities, and resource uses. The coal tracts included in the proposed 1984 coal lease sale are all in areas covered by existing planning. Site-specific tract profiles have been completed for all of them, and all are included in the draft Round II coal lease sale EIS (USDI, BLM 1984a).

Oil and Gas

Comments Received

Twenty-two comments on oil and gas were received, eleven from individuals, eight from the Rocky Mountain Oil and Gas Association, one from Shell Oil, and one each from the State Oil and Gas Conservation Commission and the U.S. Fish and Wildlife Service.



Two similar comments were made on each of the following points:

The number of acres listed as restricted from development is misleading.

Factual information is not given to support the need for several of the restrictions.

There is little use in having restrictions that are waived 75% of the time.

The effects of resource protection stipulations on oil and gas development have not been considered.

A method should be devised for comparing the effects of environmental restrictions with long-term benefits.

Employment and local economics should be considered when restrictions are placed on mineral exploration and development.

Other comments on the oil and gas sections were as follows:

Oil and gas potential has not been addressed.

Alternatives that minimize oil and gas development restrictions should be listed.

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The impacts of the alternatives on minerals development should be stressed.

"No surface occupancy" areas should be substantial with sound, consistent, and thorough evidence.

Areas closed to leasing should be listed.

Do not shut the door to exploration and development along the last flank of the Big Horn Mountains.

There should be no change in management of the oil and gas resources.

Discussion

Acreage figures for areas listed as restricting development (no surface occupancy or seasonal limitations) give the maximum acreages for which such restrictions occur. Actual acreage is based on site-specific examinations for each location. The restrictions have been developed to protect resource values other than minerals. They are frequently waived following an on-the-ground analysis in which it is evident that proper and adequate mitigation can be achieved, so that restrictions on oil and gas exploration can be minimized.

Proper management of all resources precludes the need to develop any one resource at the expense of others.

All information is based on existing data. Where possible, it is coordinated with figures from other agencies. All raptor nests and big game ranges, for example, have been coordinated with the USFWS, the WGFD, or both.

Chapter 4 of this draft addresses the effects of all resource protection stipulations on oil and gas development, as well as the effects of oil and gas development on other resources. The limitations (no surface occupancy, no surface disturbance) have been expanded to cover all surface-disturbing activities, not just those that are oil and gas related.

Areas closed to leasing are listed in the various program sections under which they are found (for example, Middle Fork Canyon). All "no leasing" restrictions result indirectly from "no surface occupancy" limitations. "No lease" areas may be leased provided the applicant signs a disclaimer, to be included as a condition of the lease, that provides that the lessee acknowledge that the lease is issued solely for personal reasons and

with the understanding that extraction of the leased mineral is not practical. The lessee waives as a basis for appeal the inability to extract or develop the minerals.

Oil and gas potential has not been evaluated in any technical manner in the Buffalo Resource Area. There are several reasons, chief of which is that the BLM has never conducted technical evaluations regarding oil and gas potential for the entire resource area. Technical information and evaluation of oil and gas potential historically has been an industry function, and in most cases such information is closely guarded by the industry. By this method the industry protects its own investments and interests. General information without benefit of technical information is subject to such wide interpretation that delineating oil and gas potential is difficult at best.

The Rocky Mountain Oil and Gas Association has been most helpful recently in supplying the BLM with methodology for evaluating potential. The method was not used in this plan because oil and gas leasing and development had not been defined as an issue to be addressed in this plan until December 1983.

Exploration and development in the south Big Horns is open.

Coal

Six comments were received regarding the Buffalo Resource Area coal program, four from the state, one from the U.S. Environmental Protection Agency (EPA), and one from the Powder River Basin Resource Council. The comments were as follows:

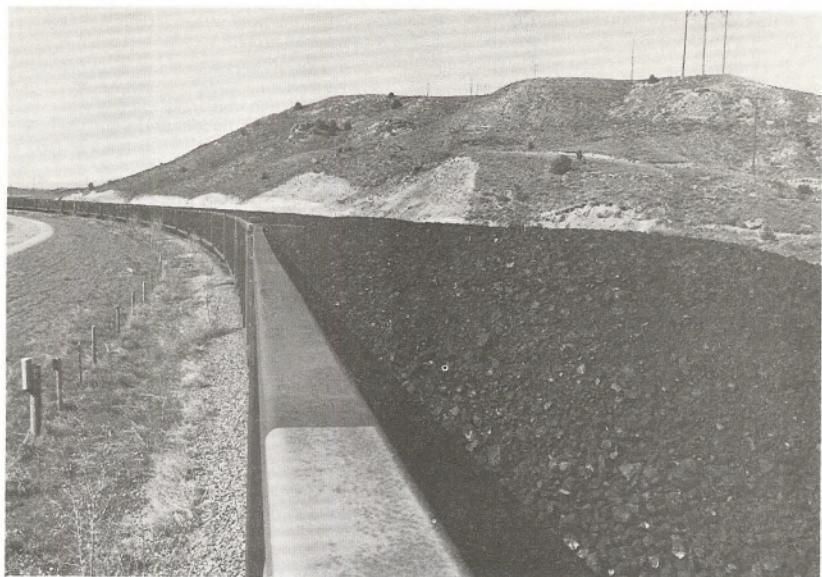
With 68 billion tons available for leasing, plans must be made for management of this resource. How would leasing affect agriculture, what would leasing do to existing mines and markets, what return to the government could be expected?

What is the potential market for coal from the Fortification Creek WSA?

The effect of the development of extractive industries on agriculture and other values should be considered.

The estimate of 10 to 14 additional coal mines by 1985 given in the draft is too optimistic—there will be only two to four new mines by that year.

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The RMP should define high and moderate coal potential and provide references to support the tonnage calculations.

It is not possible to categorize the 68 billion tons of coal as high and moderate development potential, according to GS Bulletin 1450-B (1977) or circulars 831 (1980) or 891 (1983).

The entire coal section has been revised in this second draft RMP/EIS. Information from the comments was incorporated when possible. The coal screening process was applied to new areas and reapplied to previously considered areas, and new tonnages and acreages were derived.

"High-moderate potential" is a term no longer used in the coal planning process following changes in coal regulations. Chapters 2, 3, and 4 and appendix 2 contain detailed information on the coal resource in the Buffalo Resource Area.

Recreation Management

The state made four comments on recreation. Two comments suggested that recreation access is a problem that needs to be addressed in the RMP; one listed recreational sites that should be considered; and one requested that the "willingness to pay" concept be defined.

Recreational access to public lands in the resource area is addressed by the recommendation that the Gardner Mountain and North Fork WSAs not be designated wilderness. Under this recommendation, public access would be acquired into the areas, providing for much-needed recreation opportunities.

All BLM-administered lands identified on the state list of recreational sites were considered

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during planning of the lands disposal program. All the lands were put into the "retain" or "exchange" categories.

The "willingness to pay" concept is no longer used.

Sociology

Two individuals commented on the sociological aspects of the draft. One suggested adding "intensive management policies of BLM" to the first sentence on social attitudes, page 36 of the draft. The second suggested striking the first paragraph on page 66. The sociological sections of the document have been rewritten and these comments taken into account.

Water Resources

Twelve comments on the water resources sections were received, six from the state, two from other federal agencies, three from special interest groups and one from an individual. The state comments made the following suggestions and observations:

Potential water development projects in the Powder River Drainage should be recognized in the plan (two state comments).

Table of contents for water should be changed.

The BLM should continue to recognize the state's jurisdiction in water matters and should continue to get the necessary permits before constructing the future water developments described for Alternative 2.

The BLM should consider siltation monitoring for stream bank stabilization projects.

The information that the water supply in the Fortification Creek WSA is not potable should be included in the discussion of water resources for the WSA.

The US EPA strongly urged the BLM to include all of the watershed measures discussed in the proposed alternative and said it is important to identify and discuss additional measures to improve water quality through better land and grazing management practices.

Other comments on water resources were as follows:

Prime sources of drinking water and public health and safety are major issues, especially in wilderness areas.

Contradictory to a statement made in the draft, the poor stream condition shown on the map is on private land.

The BLM, in coordination with the Wyoming Water Development Commission, should develop a thorough plan for livestock water developments and for protection of streams and ponds.

During the scoping process for identification of issues, only "on line" actions in the resource area were considered. Planning for the water development projects mentioned was not far enough along for the projects to be considered in BLM's current land use planning.

According to policy, the BLM will continue to recognize the state's jurisdiction concerning water not reserved to the federal government. Accordingly, water right applications will be submitted to the State Engineer before nonreserved water is developed on federal land.

Chapter 3 contains a description of water quality monitoring studies being conducted in the resource area. The BLM will implement additional water quality studies as necessary to evaluate progress toward meeting the resource management objectives established in activity plans.

References to the potability of water from sources in the Fortification Creek WSA were deleted from the document. The BLM does not have quantitative data on water quality from the area. Reports from other sources conflicted with BLM data to the extent that it was impossible to determine whether or not the water was potable.

All alternatives except the "no action" alternative would give priority for allocation of "new" forage produced to improvement of range condition and watershed stabilization before livestock use would be increased. Site-specific watershed protection or management actions would be implemented in conjunction with development of activity plans.

The second draft RMP/EIS contains information regarding measures of water quality in the North Fork and Gardner Mountain WSAs. In response to concern expressed regarding the potential for deterioration of water quality with increased visitor use, the BLM has established baseline water quality standards in North Fork and Gardner Mountain. Chapter 4 presents this information, together with analysis of impacts on water quality resulting from increased visitor use.

The poor stream condition shown on private land has been deleted.

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BLM policy dictates compliance with state water laws in regard to water development on public land.

Wilderness

A total of 17 comments on the wilderness program were received. Four responses suggested that the WSAs be considered as ACECs or given other protective designation. Two comments favored not designating the area wilderness, and three said that at least one area should be designated wilderness. One comments were as follows:

If access would have to be obtained across private lands, condemnation would be necessary. This should not be done.

Reasons for not designating as wilderness are not clear.

Maps are unclear; use photos.

Exclude land in T47N, R84W, sec. 31 from primitive status because of its high timber value (comment from state of Wyoming).

Other comments related to wilderness designation are included in previous sections.

Management decisions proposed in the draft RMP will protect the WSAs adequately; therefore, ACEC designations are not needed.

All wilderness recommendations are based on wilderness planning criteria (see appendix 7) and principles of multiple use management.

Alternative D would recommend that all three WSAs be designated wilderness.

No access is being proposed for the Fortification Creek WSA. Access to the Gardner Mountain WSA would be provided over BLM surface and over easements to be acquired for a proposed timber sale in the area. Access to the North Fork WSA would be negotiated with private landowners and would be attained only with their concurrence.

The timber resource on the identified tract of land was considered along with other resource values when the recommendation was made.

Wildlife

A total of 27 comments were received regarding the wildlife sections of the draft RMP. Of 15 comments received from the state, 12 were from WGFD, and 3 were from the Industrial Siting

Administration. The USFWS offices in Montana and Wyoming made 8 comments, 2 were received from special interest groups, and 2 came from individuals. Many of these comments also related to other resources (grazing, land disposal, timber harvesting) and have been addressed under those programs; they are not repeated here. The comments made the following suggestions and observations:

The BLM and the WGFD should cooperate to help curtail the diminishing bighorn sheep population in the south Big Horn Mountains.

Owners of land adjacent to WSAs should be notified if local deer and elk herds would increase because of wilderness designations.

The USFWS concurs with the BLM finding of "no effect" to bald eagles, peregrine falcons, and black-footed ferrets; however, the agency suggests a discussion in how riparian habitat improvement will benefit migrant endangered raptors.

The USFWS expects that surveys for black-footed ferrets will be included in site-specific analysis of impacts before the proposed action is implemented.

The USFWS suggests that the first draft map 6 (wildlife information) is inadequate. It does not contain many nests of state species. The list of migrating birds of high federal interest seems to have been devised only for coal. The USFWS suggests that seasonal protections included in its letter be used instead of those in the draft.

The USFWS suggests that the condition of riparian wetland habitat be given more attention and that, where protection is obviously needed, it should be provided and not delayed until long-term monitoring is completed.

Comments from Wyoming state agencies were as follows:

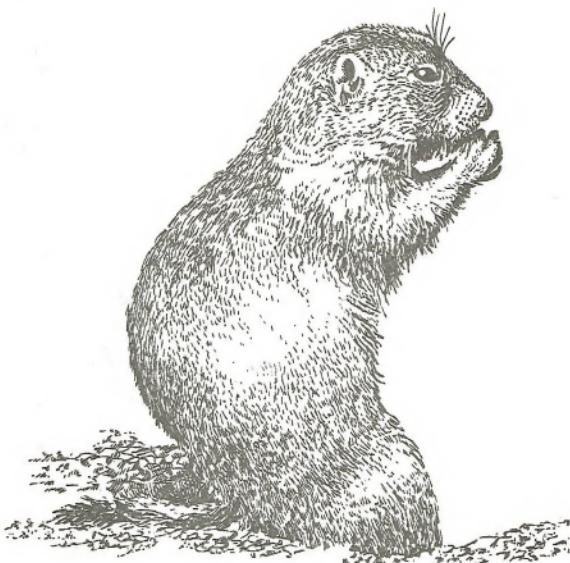
The state requests a quantitative analysis of long-term impacts on wildlife and fisheries.

The draft does not justify the allocation of 19,000 acres of crucial elk habitat to wildlife.

The BLM should make a serious attempt to protect and improve crucial winter and summer range in the Middle Fork area.

The statement that range improvement projects would affect antelope habitat should be expanded to include sage grouse and possibly sharp-tailed grouse.

Coordination; Public Involvement



New, less restrictive dates should be established for limitations on surface-disturbing activities in deer and antelope fawning areas.

Local deer and elk herd size may not increase; in fact, they may decrease over time, depending on the strategic plan of the WGFD.

An effort was made to reintroduce bighorn sheep to the south Big Horn Mountains, but it was not successful because of decreases in lamb survival, poaching, predation, disease, and scattering of populations. Until these problems are solved, transplants will not be made. The BLM will cooperate with the WGFD if suitable habitat is available for future transplants.

Owners of land adjacent to WSAs are notified through publication and distribution of this docu-

ment that local deer and elk herds are likely to increase if the WSAs are designated wilderness.

High interest raptor species are shown on map 14. However, this map provides only graphic representation of numbers and distribution. Buffer zones around nests are handled case by case. Wetland and riparian areas will be improved over the long term by range improvements and in the short term by a wetland habitat management plan.

The rest of the comments regarding changes in language and seasonal limitations for surface disturbing activities have been considered in the revised wildlife sections of chapters 2, 3, and 4.

Coordination; Public Involvement

DISTRIBUTION OF SECOND DRAFT EIS

The following sections list some of the recipients of copies of the second draft. The complete mailing list is on file at the Casper District office.

Federal Agencies and Commissions

Department of Agriculture
Agricultural Stabilization & Conservation Service
Forest Service
Soil Conservation Service
Department of Defense
Department of the Army, Corps of Engineers
U.S. Air Force
Department of Energy
Department of the Interior
Bureau of Mines
Bureau of Reclamation
Fish and Wildlife Service
Geological Survey
Minerals Management Service
National Park Service
Office of Surface Mining
Environmental Protection Agency
Federal Energy Regulatory Commission
Interstate Commerce Commission
Nuclear Regulatory Commission
Tennessee Valley Authority

Federal Elected Officials

Senator Alan Simpson
Senator Malcolm Wallop
Representative Dick Cheney

State Agencies and Organizations

Montana State Clearinghouse
Wyoming State Clearinghouse
Other Wyoming Offices
Commission on Public Lands and Farm Loans
Conservation Commission
Department of Agriculture
Department of Economic Planning and Development
Department of Environmental Quality
Department of State Lands
Energy Conservation Office
Game and Fish Department
Geological Survey
Highway Commission
Industrial Siting Administration
Land Use Commission
Oil & Gas Conservation Commission
Public Service Commission
Recreation Commission
State Engineer's Office

State Forester
State Historic Preservation Officer
State Planning Coordinator
State Land Office
Stockgrowers' Brand Inspector
Water Development Commission
Wyoming Association of Conservation Districts

State Elected Officials

Wyoming Governor's Office

Senators

Rex O. Arney
Donald Cundall
Tom Kinnison
Catherine M. Parks-Gaddis
Charles K. Scott
L. V. "Neal" Stafford
Tom Stroock

Representatives

Bob J. Burnett
Douglas Chamberlain
William A. "Rory" Cross
Lynn Dickey
Tom Getter
James C. Hageman
LaVerna "Pinkle" Hendricks
Della Herbst
Kelly F. Mader
John Marton
Peter K. Simpson
Dick Wallis

Local Governmental Agencies and Organizations

Mayors of Buffalo, Casper, Clearmont, Dayton, Gillette, Kaycee, Ranchester, and Sheridan.

County commissioners, planning offices, and agricultural agents for Campbell, Converse, Johnson, Natrona, and Sheridan counties.

Others

Copies were sent to approximately 65 different businesses and industries.

Copies were sent to approximately 40 different environmental and outdoor organizations.

Copies were sent to approximately 45 ranching operations and related associations.

Copies were sent to approximately 25 other groups, including professional societies, chambers of commerce, and the following.

Casper District Grazing Advisory Board
Casper District Advisory Council
Grazing lessees (BLM) in Johnson, Sheridan, Campbell counties
Lessees in Wilderness Study Areas
Other interested or affected individuals

Coordination; Public Involvement

FIRST DRAFT COMMENTERS

Written comments on the first draft were received from the following agencies, groups, and individuals.

Federal Agencies

Department of Energy
Western Power Administration
Environmental Protection Agency, Region VIII
Fish and Wildlife Service, Billings Office
Fish and Wildlife Services, Ecological Services, Cheyenne

Wyoming Agencies and Officials

Governor of Wyoming
Commissioner of Public Lands and Farm Loans
Department of Environmental Quality, Water Quality Division
Game and Fish Department
Geological Survey
Office of Industrial Siting Administration
Oil and Gas Conservation Commission
Public Service Commission
Recreation Commission
State Engineer's Office
State Forester
State Highway Department
State Historic Preservation Officer

Industry

Independent Petroleum Association of Mountain States
Petroleum Association of Wyoming
Shell Oil Company

Special Interest Groups

Natural Resources Defense Council, Inc.
Powder River Basin Resource Council
Wyoming Farm Bureau

Individuals

Eldon Allison, Jr
Robert O. Byron
Bob Glurgevich
Clinton D. Nagel
Thomas O'Brien
Wallace D. Ramebottom

Oral comments were received from the following persons at the June 21, 1983, public hearing.

Darrel Romain
John Ahern
Wally Ramebottom

Written responses to the notice of Intent on the proposed second draft RMP/EIS were received from the following.

Shell Western E&P, Inc.
Celsius Energy Company
Rocky Mountain Oil and Gas Association (RMOGA)
Robert O. Bryon
Garbis Sariyan

COPIES OF DOCUMENT ON FILE

Copies of this document are available for public inspection at the following locations:

Bureau of Land Management
Office of Public Affairs
Wyoming State Office
2515 Warren Avenue (P.O. Box 1828)
Cheyenne, WY 82001
Bureau of Land Management
Casper District Office
951 Rancho Road
Casper, WY 82601
Bureau of Land Management
Buffalo Resource Area
300 Spruce Street (P.O. Box 670)
Buffalo, WY 82834
Campbell County Library
412 S. Gillette Ave.
Gillette, WY 82716
Converse County Library
300 Walnut
Douglas, WY 82633
Johnson County Library
90 N. Main
Buffalo, WY 82834
Laramie County Library
2800 Central Avenue
Cheyenne, WY 82001
Natrona County Library
307 E. 2nd
Casper, WY 82601
Sheridan County Library
320 N. Brooks
Sheridan, WY 82801
University of Wyoming
University Station, Box 3334
Laramie, WY 82071

Coordination; Public Involvement

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RMP/EIS Core Team		
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Jerry Crockford	Lands and Realty/Resource Area Realty Specialist	Undergraduate work in Biology, Black Hills State College, Sheridan Community College. Seven years BLM, 15 years industry, South Dakota Forest Products.
Steve Hannan	Grazing Management/ Resource Area Range Conservationist	M.S. Range Management, Colorado State University; B.S. Wildlife Management, Texas Tech. Eight years BLM.
Lou Layman	Editing/District Writer-Editor	B.S. Journalism, University of Colorado. Five years editing planning and environ- mental documents for BLM, 2 years National Park Service, 1½ years newspapers and public information.
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Darrel Schwilling	Cartographic Coordination/ District Landscape Architect	B.L.A. Kansas State Univers- ity. Three years BLM.
Don Whyde	Planning/District Planning Coordinator	B.S. Forest Management, Uni- versity of Montana. Fourteen years BLM, 7 years Forest Service.

Coordination; Public Involvement

Name	Responsibilities/ Position	Qualifications
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Mike Brogan	Water Resources/District Hydrologist	B.S. Watershed Management/Hydrology, B.S. Forest Management, Colorado State University. Five years BLM, 1 year Geological Survey.
Jan Dietz	Clerical and Word Processing Coordination, Assistance in preparation for printing/ District Support Services Supervisor	Two years BLM; 2½ years Geological Survey/Minerals Management Service; 2 years Farmers Home Administration, USDA; 16 years private industry.
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Leslie Horsch	Water Resources/District Hydrology Technician	B.S. Watershed Sciences, Colorado State University. Three seasons BLM, 2 seasons Forest Service.
Jim Johnson	Fire Management/District Fire Management Officer	B.S. Outdoor Recreation, Colorado State University. Five years BLM, 9 years National Park Service.

Coordination; Public Involvement

Name	Responsibilities/ Position	Qualifications
John Kolnik	Lands and Realty/Resource Area Realty Specialist	B.S. Range Management, University of Wyoming. Ten years BLM, 1 year State of Wyoming.
Laurence E. Marks	Economics/District Economist	M.S. Agricultural Economics; B.S. Farm and Ranch Management, Colorado State University. Four years BLM; 1 year Farmer's Home Administration, USDA; 4 years Foreign Agricultural Service, USDA.
Paul B. Myers	Sociology/Denver Service Center Sociologist	Ph.D. Resource Development, Michigan State University; M.A. Sociology, University of Kentucky; B.A. Sociology, University of Texas at Austin. Eight years BLM.
Robin Nelson	Mailing Lists/District Computer Assistant	Attended Casper College. Five years BLM, 8 years private industry.
Gene Robinson	Oil and Gas/Resource Area Natural Resource Specialist	B.S. Forestry; Assoc. Mining and Reclamation Technology, University of Kentucky. Three years BLM, 4 years Office of Surface Mining.
Neil Schiche	Forestry/Resource Area Forester	Post-bachelors work in Forest Economics and Finance, University of Montana; B. S. Wildlife Biology, Colorado State University. Four years BLM, 2 years Forest Service, 1 year Bureau of Indian Affairs, 1 year State University North Dakota Forestry Division, 1 year Illinois Forest Preserve District.
Cloetta Schroeder	Word Processing, Proofreading Assistance/District Clerk-Typist	Associate degree, Data Processing, Casper College; Certificate of Secretarial Science. Four years BLM.
Wayne Sutherland	Coal, Mineral Materials/Resource Area Geologist	M.A. Geomorphology, University of Wyoming; B.A. Geology, University of Wyoming. Five years BLM, 1 year Industry, Mine Geologist.
Chuck Wilkie	Air Quality, Coal/Powder River Coal Team Leader, Casper District	M.S. Range Management, University of Nevada; B.S. Range Management, University of Wyoming. Eighteen years BLM.

Coordination; Public Involvement

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Name	Position
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Scott Brayton	Public Affairs Specialist, Wyoming State Office
Carol Ross	Graphics, Wyoming State Office
Tina Warren	Phototypesetting, Wyoming State Office
Jon Winemiller	Supervisory Draftsman, Wyoming State Office

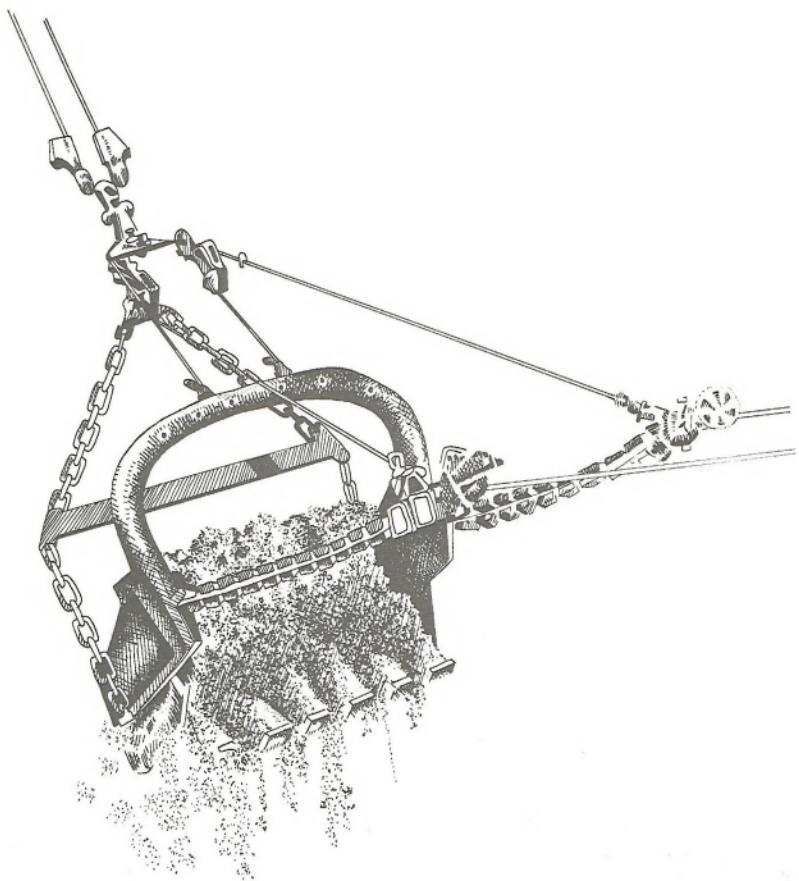
Coordination, support, and review were provided by the Divisions of Minerals, Lands and Renewable Resources, Operations, and Planning and Environmental Assistance, Casper District. From the Wyoming State Office, the Divisions of Minerals, Lands and Renewable Resources, and Operations provided coordination and review.

Printing arrangements were made by the Branch of Administrative Services, Wyoming State Office.



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Appendices



APPENDIX 1: SUMMARY OF SUGGESTED ISSUES

This table briefly outlines the issues that were suggested for consideration in this RMP/EIS. A more detailed discussion of suggested issues is available for review at the Buffalo Resource Area office.

<u>Suggested Issue</u>	<u>Addressed as an Issue in the RMP?</u>	<u>Explanation</u>
In-stream flow legislation	No	The state of Wyoming has jurisdiction unless a federally reserved water right is affected.
Stream channelization legislation	No	BLM has no jurisdiction over water rights. Flood-plains and riparian habitat are covered by executive orders.
Predator control	No	A district predator control plan was completed in 1983 and is incorporated into the "no action" alternative.
Coal gasification	No	This is under the jurisdiction of the Wyoming Department of Environmental Quality and the Industrial Siting Commission.
Data from various surveys indicate that rangeland in parts of 29 "I" allotments is in poor to fair condition, and conflicts exist in some of these areas between livestock grazing and wildlife forage demands.	Yes	See "Grazing Management" issues in chapter 1.
Coal slurry pipelines	No	The state of Wyoming has jurisdiction unless a federally reserved water right is affected.
"Sagebrush Rebellion"	No	No legal authority because this requires congressional action.
Use restrictions on watersheds	No	Surface development activity is addressed in several environmental assessments and the existing MFP. Those decisions are incorporated into the "no action" alternative.
Reclamation of surface damages	No	This is addressed in several environmental assessments and the existing MFP. Those decisions are incorporated into the "no action" alternative.
Weed and pest control	No	A district weed control environmental assessment was completed in 1982 and is incorporated into the "no action" alternative.
Potential Recreation and Public Purpose (R&PP) lands	No	All areas either have been resolved or have been withdrawn by the applicants.
The scattered and complex pattern of public land makes management difficult and uneconomical.	Yes	See "Lands and Realty" issues in chapter 1.

Suggested Issues

APPENDIX 1: SUMMARY OF SUGGESTED ISSUES
(continued)

<u>Suggested Issue</u>	<u>Addressed as an Issue in the RMP ?</u>	<u>Explanation</u>
Corridors	No	A corridor study was completed in 1977 with public input. It is incorporated into the "no action" alternative.
Withdrawal review	No	This is standard policy.
Trespass	No	This is standard policy.
Underground water development	No	The state of Wyoming has jurisdiction unless a federally reserved water right is affected.
Uranium development	No	The BLM has no authority to exclude lands from development except by withdrawals. BLM cannot stop development of valid claims, but controls are provided by regulations set forth in 43 CFR 3809, which deals with surface management of mining claims under the general mining laws.
Oil and gas development	No	The Buffalo oil and gas environmental assessment was completed in 1980 and is incorporated into the "no action" alternative.
Gathering information on the resource area's potential for energy and mineral resources and using it when developing land use allocations.	No	The BLM is committed to multiple use management. Existing resource information is used in making decisions. This information is continually updated by the Minerals Division of the district office.
Probable change in the oil and gas leasing procedure	No	This can be changed only by a Department of the Interior action.
Implementation of the regulations under 43 CFR 3809.	No	This is standard operating procedure.
Establishing a permit system for geophysical exploration	No	This can be changed only by a Department of the Interior action.
Full fire suppression is not needed in the entire resource area, and prescribed burning should be used to support other programs.	Yes	See "Fire Management" issues in chapter 1.
Identification of areas of critical environmental concern (ACECs)	No	These were identified in the existing MFP. See chapter 3.

Suggested Issues

APPENDIX 1: SUMMARY OF SUGGESTED ISSUES (continued)

Suggested Issue	Addressed as an issue in the RMP?	Explanation
Recommendations must be made on the three Wilderness study areas in the Buffalo Resource Area.	Yes	See "Wilderness" issues in chapter 1.
All public land must be analyzed and designated with respect to off-road vehicle (ORV) use.	Yes	An ORV plan for Johnson County was completed in 1980 and is incorporated into the "no action" alternative. See "Recreation" issues in chapter 1.
Public access: Blocks of public land are not legally accessible without permission from owners of adjacent land.	No	Decisions in the existing MFP provide for access agreements with owners of adjacent property. Those decisions are included in the "no action" alternative. See "Lands and Realty" issues in chapter 1.
Management in the Middle Fork area	No	An activity plan/environmental assessment was completed in 1981 and is incorporated into the "no action" alternative.
Management of the Petrified Tree area (Dry Creek)	No	An activity plan/environmental assessment was completed in 1980 and is incorporated into the "no action" alternative.
Environmental Education Areas	No	Areas had been identified in past planning efforts, but school districts did not follow up on them because there was no longer a need or desire.
Only coal with high and moderate potential for development was reviewed in past planning efforts, and new regulations direct planning to all coal with development potential.	Yes	See "Minerals Management" issues in chapter 1.
Problems in acquiring easements, effects on big game, and fluctuations in market conditions could be dealt with more effectively if timber sales could be rescheduled when necessary.	Yes	See "Forest Management" issues in chapter 1.
If allowed, sales of forest products from woodlands would help meet the increasing demand.	Yes	See "Forest Management" issues in chapter 1.
Livestock grazing on commercial forestlands may be impairing the productive capacity of certain forest sites.	Yes	See "Forest Management" issues in chapter 1.
Priorities should be assigned for preparation of habitat management plans according to the management needs and capabilities of areas with habitat management potential.	Yes	See "Wildlife Habitat Management" issues in chapter 1.
Increased activity in various land uses leads to an increased need for more intensive management to protect cultural resources.	Yes	See "Cultural Resource Management" issues in chapter 1.



APPENDIX 2: COAL ACTIVITY IN THE BUFFALO RESOURCE AREA

COAL SCREENING PROCESS

This appendix describes the coal screening process as applied in the Buffalo Resource Area.

Call for Coal Resource Information

A call for coal resource information was published in the *Federal Register* on October 19, 1983. The call was also placed in legal notices in five Wyoming and Montana newspapers. No new coal resource information was received.

Possibly because of a misunderstanding, two companies sent expressions of interest in maintenance tracts next to the existing Keeline and Echeta leases. The companies may have thought the call for coal information was instead a call for expressions of interest, a later step in the coal planning process. Sixteen letters were received that expressed support for these expressions of interest.

Identification of Coal Lands

Coal lands that have development potential have been defined through the use of coal resource occurrence maps, coal development potential maps, BLM and GS information, and information from industry.

The baseline for this RMP was established with completion of MFPs for the Eastern Powder River Region in 1977 and the Western Powder River Region in 1979. Coal-related land use planning amendments were prepared later for the Gillette, Highlight, Western Powder River, and Recluse review area (USDI, BLM 1980a, 1980i, 1981a, 1982a). The Forest Service followed the BLM's lead and applied coal unsuitability criteria to the Thunder Basin National Grassland review area (USDA, FS 1982).

Coal planning completed in these amendments was done on the basis of coal having high to moderate development potential. The high-moderate coal boundary (a line defined by geologic principle) was used to define the coal planning areas. A major problem arises during coal tract delineation where tracts are defined by legal subdivision and the high-moderate coal line is

not. To alleviate this problem, coal planning in this RMP has been extended and completed in areas where this situation has the potential to cause problems.

Because of recent changes in the coal planning regulations, coal land is no longer addressed in terms of high or moderate development potential. Areas now considered are those having potential for coal development. Further information obtained by the BLM earlier in 1984 indicated that the Buffalo Resource Area contains federal coal with development potential that was not included in the previous coal amendments. About 2.1 million acres of federal coal was reviewed during the preparation of this RMP/EIS.

Application of Unsuitability Criteria

As required by 43 CFR 3461, the 20 coal unsuitability criteria were applied to all known federal coal land in the Buffalo Resource Area that has development potential. The criteria involve consideration of scenic areas, natural and historic values, wildlife, floodplains, alluvial valley floors, and other special values. The purpose of this step is to identify areas with key features that would make them unsuitable for coal mining.

Through the unsuitability criteria, about 144,000 acres containing about 9 billion tons of federal coal has been declared unsuitable for mining. About 524,000 acres containing about 32 billion tons of federal coal has been defined as acceptable pending study.

Within the acreage in the category of "unacceptable pending further study" are resources such as high interest wildlife species and alluvial valley floors. The cost of placing the various areas containing these resources in one of the other categories (acceptable or unsuitable) would be expensive for both the state and federal governments, especially when the total area involved is considered. It is not cost effective to perform such action at this time in the planning process. Rather, a final determination can be made if and when a portion of these areas would be included in an expression of interest and included in a proposed competitive tract. During the tract delineation process which precedes leasing, land included in a tract that is defined as "acceptable pending study" would be given another review.

Coal Activity

The expenditure of funds at that time to make a designation as either acceptable or unsuitable would be cost-effective because the relatively small number of acres being reviewed. The designation of areas during the RMP as acceptable pending further study assures that resource concerns would be examined closely during the coal activity planning.

The results of applying the unsuitability criteria in the Thunder Basin National Grassland are documented in *Unsuitability Criteria Assessment: High to Moderate Coal Potential: Thunder Basin National Grassland* (USDA, FS 1982). This document is available for review from the Forest Supervisor, Medicine Bow National Forest, Laramie, Wyoming.

Overlays were compiled at 1:24,000 scale to show areas where one or more of the criteria applied. The "suitable," "unsuitable," and "acceptable pending study" areas shown on map 9 are strictly for graphic purposes. The 1:24,000 scale overlays are the working maps. They are available for review at the Buffalo Resource Area office.

Table AP 2-1 shows the acreage and tonnage affected by each criterion. The following discussion indicates the data source used for each criterion, describes the results of applying each criterion, and indicates mitigation that may apply.

Criterion 1: Federal Land In National Systems

Data Sources

Buffalo Resource Area planning documents were used as data sources.

Assessment

The review area contains no national parks, designated wilderness, or other federal lands that meet the definition for unsuitability.

Criterion 2: Rights-of-Way and Buffers

Data Sources

The following sources were used for data for criterion 2:

- Campbell County road map
- Tri-County Electric Association circuit diagram
- Campbell County subdivision diagram
- Wyoming State Geologist Oil and Gas Map of Wyoming Structure Index Map

Sheridan County rural addressing system
MT plats
GS topographical maps
Orthoquads
BLM planning documents
½" to 1 mile BLM surface management maps

Assessment

Most of the rights-of-way crossing federal coal lands in the Buffalo Resource Area could be relocated to accommodate coal mining. For this reason, the BLM made a general determination that rights-of-way over federal coal are acceptable for coal leasing and development subject to valid existing rights. Negotiation would be conducted when necessary for relocation of facilities, and appropriate stipulations would be developed.

Some rights-of-way could present major conflicts—particularly federal highways and main line railroads. For this reason, the right-of-way and buffers for I-25, I-90, and main line railroads were declared unsuitable. These encompass about 6,730 acres and contain about 370 million tons of coal (calculated at a 200-foot right-of-way and a 100-foot buffer on each side of the right-of-way).

Criterion 3: Dwellings, Roads, Cemeteries, and Public Buildings

Data Sources

The following sources were used for data for criterion 3:

Campbell County road map
Tri County Electric Association circuit diagram
Campbell County subdivision diagram
Wyoming State Geological Oil and Gas Map of Wyoming Structural Index Map
MT plats
GS topographical maps
Orthoquads
BLM planning documents
½" to 1 mile BLM surface management maps

Assessment

About 390 acres around dwellings, containing about 20 million tons of coal, were determined to be unsuitable. This does not include buffers for major rights-of-way, since those are included in criterion 2. Churches, public parks, and community or institutional buildings are within the community buffers established during the application of planning constraints.

Coal Activity

TABLE AP 2-1
COAL UNSUITABILITY CRITERIA
AS APPLIED IN THE BUFFALO RESOURCE AREA

<u>Criterion</u>	<u>Acreage Unsuitable</u>	<u>Billion Tons</u>	<u>Acceptable Pending Study</u>	<u>Billion Tons</u>
1. Federal land in national systems	0			0
2. Rights-of-way and buffers	6,732	.370		0
3. Buffer zones for dwellings, roads, etc.	391	.02		0
4. Wilderness Study Areas	960	.05		0
5. Federal lands having outstanding scenic quality (class 1)	0			0
6. Federal lands being used for scientific study	0			0
7. Historic lands and sites	0	0		0
8. Natural areas	40	.001		0
9. Federally listed endangered species habitat			24,797	1.658
10. State-listed species-- endangered or threatened	0			0
11. Bald and golden eagle nests	115,869	6.938	1,361	.026
12. Bald and golden eagle route and concentration areas	980	.017		0
13. Falcon cliff nesting sites	5,702	.454		0
14. Migratory bird habitat	460	.05	93,760	6.117
15. Habitat for state high interest fish and wildlife	13,338	.65	207,836	9.371
16. Floodplains	0			0
17. Municipal watersheds	0			0
18. National resource waters	0			0
19. Alluvial valley floors			195,984	14.879
20. State proposed criteria	0			0
Total	144,472	8.55	523,738	32.051

Coal Activity

Any tracts delineated in the future would be examined for occupied dwellings or other features addressed by this criterion. If any such features were located, an appropriate area would be declared unsuitable or mitigation would be defined.

Criterion 4: Wilderness Study Areas

Data Sources

Data for criterion 4 came from the Casper District wilderness inventory.

Assessment

The review area contains part of the Fortification Creek Wilderness Study Area. This area contains 960 acres and 0.05 billion tons of coal. The area is unsuitable while under review by the Administration and the Congress for possible wilderness designation. The study is scheduled to be complete by 1986.

If the Congress should designate the area wilderness, the coal resource would remain unsuitable for mining. If the area is not designated wilderness, coal development could be considered at some future time, subject to necessary coal planning and to appropriate mitigation if coal development should be permitted.

Criterion 5: Lands With Outstanding Scenic Quality

Data Sources

Data for criterion 5 came from Buffalo Resource Area planning documents.

Assessment

None of the lands in the review area meet the scenic requirements outlined for this criterion.

Criterion 6: Lands Used for Scientific Study

Data Sources

Buffalo Resource Area planning documents were the data sources for criterion 6.

Assessment

The review area does not contain any lands that are under permit for or are being used for scientific study.

Criterion 7: Historic Lands and Sites

Data Sources

The following data sources were used for criterion 7:

BLM prehistoric and historic sites files
Cultural records of the Wyoming Recreation Commission
Historical documents in the Archives, Museums, and Historical Research Division, state of Wyoming
Historical records in BLM District and State offices

Assessment

There are no sites in the review area that are listed on the National Register of Historic Places; consequently, no areas will be declared unsuitable under criterion 7.

The resource area does contain known sites that may have potential for listing on the National Register. If one of these sites should be included in a competitive tract, the BLM, in consultation with the State Historic Preservation Office, would determine the acceptability for mining. If the site was determined acceptable for surface mining, appropriate mitigation to salvage the resource or to protect the site would be defined.

Criterion 8: Natural Areas

Data Sources

Buffalo Resource Area planning documents were the data sources for criterion 8.

Assessment

The Dry Creek Petrified Tree Natural Area was identified as unsuitable. This area covers about 40 acres containing about 10 million tons of coal. No other lands in the review area have been designated natural areas or national natural landmarks.

Criterion 9: Habitat for Federally Listed Endangered Species

Data Sources

The following data sources were used for criterion 9:

U.S. Fish and Wildlife Service
Wyoming Game and Fish Department
BLM records and documents; field studies

Coal Activity

Assessment

About 24,800 acres containing about 1.7 billion tons of federal coal was determined to be acceptable pending study. These areas encompass prairie dog towns that may potentially provide habitat for the black-footed ferret.

Bald eagles are not included under this criterion because they are covered under criteria 11 and 12.

After an expression of interest is noted and before tract delineation, the BLM would conduct further site-specific investigations of the proposed tract area and adjacent land to refine the application of this criterion. If the investigations should reveal the presence of species covered by this criterion, the BLM would then consult further with the U.S. Fish and Wildlife Service to determine if any federal coal lands within the proposed tract area should be declared unsuitable, if the exception contained in the criterion could be applied, or if the area could be developed with appropriate mitigation.

Criterion 10: Habitat for State-Listed Species

Data Sources

Data for criterion 10 came from the Wyoming Game and Fish Department.

Assessment

There are no state-listed endangered or threatened species for Wyoming.

Criterion 11: Bald and Golden Eagle Nests

Data Sources

The following data sources were used for criterion 11:

U.S. Fish and Wildlife Service
Wyoming Game and Fish Department
BLM records and documents; field studies

Assessment

About 111,000 acres containing about 6.66 billion tons of federal coal was determined unsuitable because of golden eagle nests and buffer zones. About 1,360 acres containing about 26 million tons was determined to be acceptable pending study. This figure includes nests that may be abandoned.

About 4,870 acres containing about 277 million tons of federal coal was declared unsuitable because of bald eagle nests and buffers.

After an expression of interest is noted and before tract delineation, the BLM would conduct further site-specific investigations of the proposed tract area and adjacent land to refine the application of this criterion. If the investigations should reveal the presence of species or habitats affected by this criterion, the BLM would then consult further with the U.S. Fish and Wildlife Service to determine if any federal coal lands within the proposed tract area should be declared unsuitable, if the exceptions contained in the criterion could be applied, or if the area could be developed with appropriate mitigation to protect eagle nests and buffers.

Criterion 12: Eagle Roosts and Concentration Areas

Data Sources

The following data sources were used for criterion 12:

U.S. Fish and Wildlife Service
Wyoming Game and Fish Department
BLM records and documents; field studies

Assessment

Bald eagle roosts and buffers encompassing about 980 acres containing about 17 million tons of coal were declared unsuitable. There are no known golden eagle roosts or concentration areas in the review area.

After an expression of interest is noted and before tract delineation, the BLM would conduct further site-specific investigations of the proposed tract area and adjacent land to refine the application of this criterion. If the investigations should reveal the presence of roosts or concentrations of bald or golden eagles, the BLM would then consult further with the U.S. Fish and Wildlife Service to determine if any federal coal lands within the proposed tract area should be declared unsuitable, if the exception contained in the criterion could be applied, or if the area could be developed with appropriate mitigation.

Criterion 13: Falcon Cliff Nesting Sites

Data Sources

The following data sources were used for criterion 13:

Coal Activity

U.S. Fish and Wildlife Service
Wyoming Game and Fish Department
BLM records and documents; field studies

Assessment

About 5,700 acres containing about 454 million tons of federal coal was determined unsuitable because of prairie falcon nests and buffers.

After an expression of interest is noted and before tract delineation, the BLM would conduct further site-specific investigations of the proposed tract area and adjacent land to refine the application of this criterion. If the investigations should reveal the presence of species or habitats affected by this criterion, the BLM would then consult further with the U.S. Fish and Wildlife Service to determine if any federal coal lands within the proposed tract area should be declared unsuitable, if the exception contained in the criterion could be applied, or if the area could be developed with appropriate mitigation.

Criterion 14: Migratory Bird Habitat

Data Sources

The following data sources were used for criterion 14:

U.S. Fish and Wildlife Service
Wyoming Game and Fish Department
BLM records and documents; field studies
Helen Downing, Sheridan ornithologist

Assessment

Two active merlin nests plus appropriate buffers were declared unsuitable. These sites encompass about 480 acres containing about 50 million tons of coal.

About 93,800 acres containing about 6 billion tons of federal coal were determined to be acceptable pending study. This includes nests and buffers for ferruginous hawks and burrowing owls.

After an expression of interest is noted and before tract delineation, the BLM would conduct further site-specific investigations of the proposed tract area and adjacent land to refine the application of this criterion. If the investigations should reveal the presence of species or habitats affected by this criterion, the BLM would then consult further with the U.S. Fish and Wildlife Service to determine if any federal coal lands within the

proposed tract area should be declared unsuitable, if the exception contained in the criterion could be applied, or if the area could be developed with appropriate mitigation.

Criterion 15: Habitat for State High-Interest Species

Data Sources

The sources for criterion 15 were Wyoming Game and Fish Department data and BLM records and field studies.

Assessment

Federal coal lands along the Powder River and its major tributaries (Crazy Woman Creek and Clear Creek) were determined unsuitable because these waters provide essential habitat for the shovelnose sturgeon, goldeye, and sturgeon chub. Federal coal lands found unsuitable encompass about 9,800 acres containing 364 million tons of coal. These areas could be further refined as information becomes available.

About 1,200 acres containing 168 million tons of federal coal was determined unsuitable because of the Lewis woodpecker. About 2,300 acres containing about 118 million tons of federal coal was determined to be unsuitable because of critical elk range.

Approximately 207,800 acres containing 9.4 billion tons of federal coal was determined to be acceptable pending study for sage grouse and sharp-tailed grouse.

After an expression of interest is noted and before tract delineation on areas determined acceptable pending study, the BLM would conduct further investigations on the proposed tract area and adjacent land and refine the application of this criterion. Further consultation with the Wyoming Game and Fish Department would be conducted to determine if any federal coal lands within the proposed tract area should be declared unsuitable or if surface mining could proceed with appropriate mitigation to protect state high-interest species.

Criterion 16: Floodplains

Data Sources

The following data sources were used for criterion 16:

Coal Activity

Flood hazard boundary maps
Community 560047 (Sheridan Co.)
Community 560081 (Campbell Co.)
U.S. Department of Housing and Urban Development
Federal Insurance Administration
National Flood Insurance Program
Wyoming State Engineer's Office
Rogers Sanders, Engineer, Sheridan Co.
Ray Smith, Engineer, Campbell Co.

Assessment

No areas were found unsuitable on the basis of this criterion. It has been determined that all identified floodplain areas can be mined by all or certain stipulated methods of coal mining without substantial threat or loss to people or property, and without substantial threat of loss to the natural and beneficial values of the floodplain. Examples of mitigation are relocation of channels during mining and restoration of channels to former locations after mining, controlling sediment yields and prohibiting spoil dumping in channels, lining channel bottoms, revegetation, and general practices for mined land reclamation.

Criterion 17: Municipal Watersheds

Data Sources

Data sources for criterion 17 were Buffalo Resource Area planning documents.

Assessment

No areas were found unsuitable on the basis of Criterion 17. No municipal watersheds were identified in the review area.

Criterion 18: National Resource Waters

Data Sources

Buffalo Resource Area planning documents were the data sources for criterion 18.

Assessment

No areas were found unsuitable on the basis of criterion 18. There are no national resource waters in the review area.

Criterion 19: Alluvial Valley Floors

Data Sources

Data for criterion 19 came from the Wyoming Department of Environmental Quality (DEQ), Land Quality Division, and from *Reconnaissance Maps of Alluvial Valley Floors, Powder River Basin, Montana and Wyoming* (1983), prepared by Earth Resource Associates, Billings, Montana, for the Office of Surface Mining, Washington, D.C.

Assessment

The BLM identified "possible" alluvial valley floors (AVFs) on the basis of physical data such as valley width, drainage area, and current agricultural uses. In addition, a 1/4-mile buffer zone was established along each possible AVF to provide the protection specified in the criterion. The AVFs and their buffers have been placed in the category of "acceptable pending study" and, in accordance with the Department of the Interior's coal management regulations, will be considered throughout activity planning, lease sale and, if necessary, to the mine permitting stage. There are approximately 196,000 acres containing about 14.9 billion tons of coal in possible AVFs.

The Wyoming DEQ has refined the AVF data for the Buffalo Resource Area. The BLM and Wyoming DEQ identified potential AVFs as follows:

The Tongue River, Fivemile Creek, Sixmile Creek, Earley Creek, Slate Creek, Ash Creek, Youngs Creek, Little Youngs Creek, Prairie Dog Creek, Dutch Creek, Wildcat Creek, and Goose Creek, all in Sheridan County.

The Powder River, Clear Creek, Piney Creek, Crazy Woman Creek, and Hanging Woman Creek, all in Johnson County.

The Powder River, Belle Fourche, Wildcat Creek, Wild Horse Creek, Spotted Horse Creek, Coal Creek, Caballo Creek, Rawhide and Little Rawhide, Hay Creek, Middle Prong Wild Horse Creek, Gold Mine Draw, Tisdale Creek, Dry Fork Little Powder, Little Powder, Horse Creek, and Bitter Creek, all in Campbell County.

All were identified tentatively from maps, field visits, mine permits, and permit applications. The DEQ indicates that there could be smaller areas or other unidentified drainages with potential AVFs. DEQ's analysis does not include a determination as to whether or not the AVFs identified are significant to farming. The areas identified as potential AVFs would be considered further by OSM and Wyoming DEQ at the time of mine plan approval and mine permitting.

Coal Activity

Criterion 20: State Proposed Criteria

Data Sources

Data for criterion 20 came from the Wyoming Governor's Office and from resource area planning documents.

Assessment

The state of Wyoming has no criteria; therefore, no areas were found unsuitable on the basis of criterion 20.

Multiple Use Analysis

Background

Multiple use analysis is a review of federal coal lands that remain acceptable after the unsuitability criteria have been applied. The review involves consideration of other multiple use values (not related to the unsuitability criteria) that would make an area unsuitable for coal mining. During this step, conflicts are identified and planning decisions are applied that may preclude coal leasing, such as designation of community buffers, completion of oil and gas development before coal development can begin, or setting aside lands for recreation and public purpose uses.

The Forest Service applied land use planning decisions in the Thunder Basin National Grassland in 1982. The results are discussed in the *Unsuitability Criteria Assessment* (USDA, FS 1982).

The following sections describe conflicts and planning decisions applied to federal coal lands in the Buffalo Resource Area.

Producing Oil and Gas Fields

Conflicts: Surface coal mining may conflict with oil and gas operations in known geologic structures (KGSs).

Decisions: Coal leasing will be deferred in producing oil and gas fields (defined by KGS boundaries) unless or until it is determined case by case that coal development will not interfere with the economic recovery of the oil and gas or that such conflicts can be mitigated. This planning decision affects about 175,000 acres containing about 20 billion tons of coal.

A formal call for expression of coal leasing interest will also request that anyone interested in leasing coal in the deferred oil and gas areas is invited to supply, along with their "expression," any oil and gas operation and production information that shows there will be no conflicts between oil and gas operations and coal development in the area(s) of interest. With BLM confirmation of the information submitted, areas within the KGSs would be available for coal tract delineation and would be given further consideration for coal leasing.

Additionally, BLM site specific teams will conduct a joint field review of possible lease tract areas before potential coal lease tracts are delineated, especially where there is high coal leasing interest. Any new information gathered in the field regarding oil and gas operations and production will be considered before coal tracts are delineated. This could make existing KGS areas available for coal leasing, or it could cause coal leasing to be deferred in newly identified KGS areas where conflicts might occur.

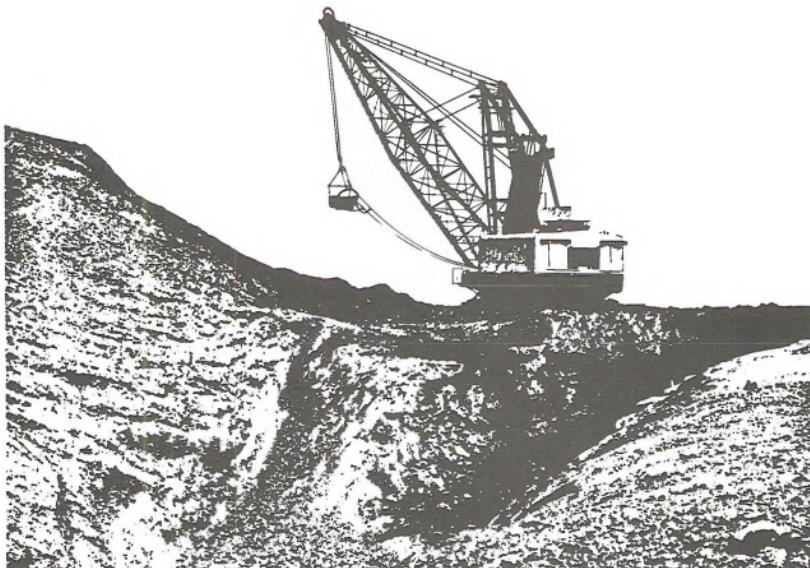
Following tract delineation, any new oil and gas operations occurring within a coal tract or new oil and gas information regarding a tract will be analyzed during the coal activity planning process. Since the coal unsuitability criteria were applied to the KGS areas, it will be possible to lift this multiple use planning constraint whenever the BLM determines either that all or portions of a KGS are no longer required for oil and gas operations or that conflicts between oil and gas operations and coal development can be mitigated.

Coal Development and Communities

Conflict: Coal development within the boundaries of cities and towns or within local planning boundaries would result in unavoidable local adverse social and economic impacts.

Decision: Community buffers will be defined for the towns of Gillette, Sheridan, Buffalo, and Wright. These buffers encompass about 45,600 acres of uncommitted federal coal lands containing about 3 billion tons of coal. These buffers are unavailable for mining.

Coal Activity



Recreation and Public Purposes

Conflict: Coal development would conflict with the intended use of existing recreation and public purpose (R&PP) facilities.

Decision: About 680 acres containing 12 million tons of coal are unavailable because of R&PP facilities. About 560 acres are west of Sheridan, and about 120 acres are within the Gillette buffer.

In addition, about 500 acres of BLM surface containing about 10 million tons of coal have been tentatively identified for public purpose use. Sheridan County will specify which of these tracts it wants to acquire under the R&PP Act by December 31, 1985. If public purpose needs for these tracts are not specified, the tracts would be available for future coal leasing after that date.

Cultural Resources

Conflict: Coal development on or near sites that may be eligible for the National Register of Historic Places could result in the loss of cultural resources.

Decision: The LX Bar Ranch site (25 acres containing about 5 million tons of coal) and the Crazy Woman Crossing and Battlefield (about 280 acres containing 10 million tons of coal) are acceptable for mining pending study. These sites may be eligible for nomination to the National Register.

Table AP 2-2 indicates the acreage and tonnage affected by multiple use analysis.

Surface Owner Consultation

Section 714 of the Surface Mining Control and Reclamation Act (SMCRA) requires that the BLM consult with certain "qualified" owners of "split estate" lands (private surface ownership over federally owned coal) when surface mining of the federal coal is being considered.

This step does not apply to areas where only subsurface mining methods are concerned. It involves only split estate lands containing federal coal that is acceptable for development by surface mining methods.

Coal Activity

TABLE AP 2-2
PLANNING CONSTRAINTS
ON COAL LEASING
IN THE BUFFALO RESOURCE AREA

<u>Constraint</u>	<u>Acres Unavailable</u>	<u>Billion Tons</u>	<u>Acceptable Pending Study</u>	<u>Billion Tons</u>
Oil and gas development ^a	175,200	19.79		
Community buffers	45,600	3.0		
Recreation and Public Purposes	560	.1	500	0.1
Cultural resources	—	—	<u>305</u>	<u>0.015</u>
Total	221,360	22.89	805	0.115
Rounded to 1	221,000	23	800	0.1

a. Coal leasing would be allowed in known geologic structures (KGSSa) where it can be shown that economic recovery of oil and gas is or will be completed prior to commencing coal mining operations. These conflicts would be evaluated case by case.

In this consultation process, qualified surface owners are asked to express their preference for or against surface mining of the federal coal under their private land. Expression of a preference against surface mining, either by an individual or by a significant number of these surface owners, can result in federal coal land being unavailable for coal development. Such areas can still be considered for possible leasing beyond this stage. This is possible because the surface owner's formal consent or refusal to consent does not occur until later in the coal activity planning process.

Letters were sent by certified mail to 848 surface owners of record in Campbell County whose land overlies federal coal land with development potential. The owners were asked to express their preference for or against surface mining. At the end of the response period, 104 letters had been returned unclaimed and 376 landowners had made some response, with 115 indicating a preference against surface mining on all or part of their land. Preferences expressed against mining encompassed about 144,000 acres.

No attempt was made to distinguish qualified surface owners except in the case of major energy companies such as Amoco, who did not receive consultation letters. Fourteen of the 376 respondents said they were not qualified surface owners; several others said they had only recently bought or sold the surface. Two surface landowners live outside the United States and could

not receive certified mail, but they were contacted by first class mail. Not all returned responses were signed or completed.

Time constraints did not permit individual consultation with surface owners in Johnson and Sheridan counties during preparation of this document. However, when surface owners in that area were contacted in 1981 during preparation of the Western Powder River coal amendment (USDI, BLM 1981a), 66 indicated a preference against surface mining.

Legal notices were placed in local newspapers and in the *Federal Register* in February and March 1984 to ask surface owners in Johnson and Sheridan counties to express their preference. Three responses were received; one indicated a preference against surface mining. Formal consultation is underway through certified mailings to affected landowners in this area. It will be completed before publication of the proposed final RMP/EIS.

No area has been dropped from further consideration for leasing as a result of responses received from surface owners. However, before future coal tracts are delineated where surface owners have expressed a preference against leasing, the owners will be contacted again concerning their qualifications as surface owners and their preference for or against surface mining. If it appears that a significant number of owners

Coal Activity

are "qualified" and express preference against surface mining, potential lease tracts will not be delineated on the private lands involved.

Mitigation for Coal Activity

Federal lands in the Buffalo Resource Area will be developed in compliance with all applicable federal, state, and local laws and regulations. Existing laws and regulations form the basis of the federal coal leasing program. Therefore, enforceable statutes, performance standards, and other license requirements are considered part of proposed federal actions under all alternatives.

Mitigative measures will be applied as required. General mitigation requirements and mitigative measures for individual tracts in the Buffalo Resource Area are defined in appendix C of the Round II Powder River coal EIS (USDI, BLM 1984a).

The general types of mitigating measures are as follows:

Cultural Resources: Field inventories and procedures for protection of cultural resources

Paleontological Resources: Survey and resource recovery

Existing Rights: Negotiation procedures

Soils: Separation of "B" horizon material from underlying material

Survey Markers: Protection from damage; provision for replacement

Raptors: Buffer zones around nesting areas and restrictions as necessary on surface mining

Black-Footed Ferret Habitat: Monitoring and inventory in accordance with prescribed guidelines

Migratory Birds of High Federal Interest: Habitat recovery and replacement

Buffer Zones and Rights-of-Way: Buffer zones unsuitable for surface mining for existing public facilities

Alluvial Valley Floors: Mitigation or designation of unsuitability pending final determinations by authorized agencies

and the Surface Mining Control and Reclamation Act of 1977 (SMCRA). These two acts, and various departmental guidelines that followed, defined procedures for applying the coal planning process. Except for the recent addition of the "call for coal resource information," the process has remained unchanged since 1977.

Many changes have occurred in the mechanics of applying the coal planning process since 1977. Most of the changes have resulted from changing national priorities.



COAL PLANNING IN THE BUFFALO RESOURCE AREA

Statutory Requirements

The statutory requirements controlling development of federal coal are reflected in the Federal Land Policy and Management Act of 1976 (FLPMA)

Coal Planning Amendments

Four amendments were prepared to the management framework plan (MFP) for the Buffalo Resource Area to comply with the statutory requirements mandated in the acts previously cited. Each amendment addressed coal planning in a specific geographic portion of the resource area, and each was subjected to full disclosure

Coal Activity

through public meetings and comment periods. A draft and final document was prepared for each area—the Gillette, Highlight, Western Powder River, and Recluse review areas (USDI, BLM 1980a, 1980l, 1981a, 1982a).

Applicable land use decisions from those amendments have been consolidated in this RMP. When the final RMP is approved, decisions therein will guide management of the coal resource in the Buffalo Resource Area. Although the MFP amendments previously cited will be useful for detailed background information, coal planning will be governed by the RMP.

Because the amendments cited form the baseline for the "no action" alternative in this document, their content is briefly summarized in the following sections.

Gillette Review Area

Area Description

The Gillette Review Area lies in a band 4 to 10 miles wide along Wyoming Highway 59 and U.S. Highway 14-16 from about 15 miles south of Gillette to about 30 miles north of Gillette. The boundary was established along legal subdivisions to include (1) coal in the Wyodak seam of high or moderate potential for development, and (2) 13 preference right lease applications. The southern boundary is the northern boundary of the Highlight Review Area; the eastern and western boundaries correspond roughly with the known limits of high and moderate potential coal; and the northern boundary coincides with the northernmost PRLA.

The review area comprises about 154,000 acres containing 11 billion tons of federal coal.

Application of Unsuitability Criteria

After the unsuitability criteria were applied in the Gillette Review Area, about 2,400 acres containing 200 million tons of coal were found unsuitable. Unsuitable areas were defined under criteria 3, 11, and 13.

Multiple Use Analysis

A three-mile buffer was placed around the Gillette Planning District, restricting new leasing in an area adjacent to the city. When the extent of the coal resource in the entire planning area was considered, surface values for community expansion, open space, and a buffer zone exceeded mineral values in the immediate area. The buffer

excluded from further planning consideration about 29,000 acres containing 2.1 billion tons of coal.

Coal leasing was postponed in producing oil and gas fields until economic recovery of oil and gas is complete. The intent of the constraint is to maximize production of energy resources while not developing one resource to the detriment of another. The quantities of coal available for potential new leasing in the planning area make it unnecessary to create new conflicts between coal production and oil and gas production.

Surface Owner Consultation

Surface owners of record within areas found acceptable for further leasing consideration were consulted to determine their preference for or against mining. No attempt was made to determine if owners were "qualified surface owners" and no consultation was carried out in preference right lease application areas.

Letters were sent to about 100 owners. About ¼ of these indicated a preference against leasing on at least a portion of their land. The total preference against leasing involves about 17,600 acres containing 1.3 billion tons of coal. No area has been dropped from further consideration as a result of surface owner consultation.

Summary

After application of the coal screening process, about 112,000 acres containing about 8 billion tons of coal was available for further leasing consideration.

Highlight Review Area

Area Description

The Highlight Review Area in southeast Campbell County is bounded on the south and partially on the east by the Thunder Basin National Grassland. The rest of the eastern boundary corresponds to the eastern edge of the coal outcrop. The northern boundary was established primarily to ensure that the review area contained enough acreage for a fair test of the criteria. The western boundary is Wyoming 59, running from Gillette south to Reno Junction.

The total available federal coal in the review area before the unsuitability criteria were applied was about 64,000 acres containing about 9.7 billion tons of coal.

Coal Activity



Application of Unsuitability Criteria

No areas were identified as unsuitable after exceptions were considered. Although the planning process was applied to all federal coal, no decisions were made where there was an existing coal lease. The two leases within the review area have approved mining and reclamation plans.

Multiple Use Analysis

Coal development within the Highlight Oil and Gas Field will be postponed until economic recovery of the oil and gas is complete. This includes about 27,000 acres with coal reserves estimated at 4.1 billion tons.

Surface Owner Consultation

Letters were sent to 53 surface owners of record in the Highlight Review Area in February 1979. Eleven surface owners expressed a preference against surface mining, 37 expressed a preference for surface mining, and 5 did not respond.

Summary

After application of the coal screening process about 37,000 acres containing about 5.7 billion tons of coal was available for further leasing consideration.

Western Powder River Review Area

Area Description

The Western Powder River Review Area includes Johnson and Sheridan counties and PRLA in Campbell County that were not included in previous plan amendments in the Eastern Powder River Basin. The review area comprises about 323,000 acres containing about 9 billion tons of coal.

Application of Unsuitability Criteria

Federal coal lands were declared unsuitable on the basis of criteria 2, 3, 7, 11, and 12. The unsuitable areas encompass about 3,600 acres and contain about 1.3 billion tons of coal.

Multiple Use Analysis

Federal coal in T. 55 N., R. 88 W., Sections 6 and 7, is excluded from further leasing consideration to provide for a buffer zone for the city of Sheridan. Federal coal in T. 51 N., R. 81 W., Sections 18 and 19 and T. 51 N., R. 82 W., Sections 14, 22, 27, and 34, is excluded from further leasing consideration to allow for a buffer zone for the city of Buffalo.

Sheridan County has expressed interest in specific public lands for recreation and public purposes. About 500 acres containing 10 million tons of coal will not be considered further for leasing until 1985.

Segments of the Bozeman Trail fall within high and moderate potential coal areas. This trail represents an important historic resource; thus, potential lease tracts will be surveyed for trail remnants before leasing. If evidence of the trail is found, appropriate consultation and mitigating measures will be developed.

Coal leasing was postponed in producing oil and gas fields where coal development would interfere with economic recovery of the oil and gas resource. This decision deferred further consideration of coal leasing on about 2,100 acres and 80 million tons of coal.



Coal Activity

Surface Owner Consultation

Surface owners of record in high and moderate potential coal areas were consulted to determine their preference for or against surface mining. No attempt was made to determine if surface owners were "qualified surface owners," and no surface owner consultation was carried out in the PRLA areas.

Letters were sent to 286 surface owners. Sixty-six indicated a preference against leasing.

No area has been dropped from further consideration as a result of surface owner consultation.

Summary

After application of the coal screening process, about 315,000 acres containing about 1 billion tons of coal was available for further leasing consideration.

Recluse Review Area

Area Description

The Recluse Review Area covers part of northern Campbell County and an area in southern Campbell County near Reno Junction. The review area was established to include federal coal with high and moderate potential for development and an area near Reno Junction that provides an opportunity for *in situ* development of low potential coal.

The western and northern boundaries of the review area correspond to the boundaries of Sheridan and Johnson counties and the Montana state line. The southern and eastern boundaries of the review area generally follow the boundary of the Gillette Review Area and the eastern limit of the occurrence of coal with high and moderate development potential.

The *in situ* low potential coal area is within the Highlight Review Area boundary. However, land use planning was not conducted on the low potential coal area during the Highlight effort. The area is bounded on the east by the high and moderate coal line, on the west by Wyoming 59, and on the south by the Thunder Basin National Grassland.

The unsuitability criteria were applied to about 422,000 acres containing about 51 billion tons of federal coal.

Application of Unsuitability Criteria

After application of the unsuitability criteria, about 18,000 acres containing about 1.8 billion tons of coal was declared unsuitable under criteria 4, 11, 13, and 14.

Multiple Use Analysis

Coal leasing was postponed in producing oil and gas fields where coal development would interfere with economic recovery of the oil and gas resource. This decision deferred further consideration of coal leasing on about 73,480 acres containing 9.5 billion tons of coal.

Isolated tracts identified for consideration for sale or exchange in the 1977 MFP will not be so considered if they are within high and moderate potential coal areas.

A $\frac{1}{4}$ -mile buffer was established around the LX Bar Ranch Site. Leasing is not permitted within the buffer. This decision removes 25 acres containing 5 million tons of coal from further leasing consideration.

Surface Owner Consultation

Surface owners of record within high and moderate potential coal areas were consulted to determine their preference for or against surface mining. No attempt was made to determine if surface owners were "qualified surface owners." Letters were sent to 132 surface owners. Thirty-one expressed a preference against leasing.

No area has been dropped from further consideration as a result of surface owner consultation. However, before tracts are delineated where surface owners expressed a preference against new leasing, the owners will be contacted again concerning surface owner qualifications and consent to surface mining. If it appears the owner is "qualified" and intends not to give consent, potential lease tracts will not be delineated on the surface owner's land.

Summary

After application of the coal screening process, about 330,000 acres containing about 40 billion tons of federal coal was available for further leasing consideration.

APPENDIX 3: ALLOTMENT CATEGORIZATION AND GRAZING MANAGEMENT

RANGE ALLOTMENT CATEGORIZATION CRITERIA

Category "M": Maintain Existing Resource Conditions

Factors

An "M" allotment is one that is in satisfactory condition and is classified through the RMP process as an area in which the current satisfactory resource situation will be maintained.

Range Condition is Satisfactory:

The range condition has been rated good or excellent. Trend is static or improving.

Present management is adequate to maintain the allotment in a satisfactory condition.

No significant distribution problems exist.

Grazing use is evenly distributed on the allotment.

Less than 20% of the allotment is classified as potentially suitable for livestock grazing.

Period of use, kind, and numbers of livestock are in conformance with the multiple-use objectives for the allotment.

The range condition will improve, or the range management objective rating can be maintained under current management practices.

Allotment has a moderate or high resource production potential and is producing at or near its potential.

Less than 30% of the allotment is rated as unsuitable for livestock grazing because of slope, topography, or low forage production.

No significant grazing-related resource conflicts have been identified.

Forage production is adequate to meet the needs of all grazing animals on the allotment; that is, the present levels of actual livestock use and the management objective levels for other grazing animals can be accommodated.

Livestock grazing does not conflict with other consumptive and nonconsumptive resource values on the allotment.

Opportunities may exist for positive return from public investments.

The public lands are "blocked" or intermingled with other lands and provide an opportunity for multiple use management.

Management Actions

The BLM's management objective will be to take or authorize actions that will maintain current balanced use and satisfactory resource condition and productivity.

Livestock use (numbers, kind, season of use) will be permitted as authorized under a ten-year lease. Increases in use may be allowed when consistent with multiple use objectives.

Prescribed flexibility in livestock operations through consultation will be encouraged.

Range improvements will be authorized to meet management objectives.

BLM will conduct low to high intensity monitoring, depending on the value of all resources in the allotment.

Allotments will automatically be considered for a change in category when the grazing privileges are transferred or with significant changes in actual use or management.

Principal Sources of Funding

Private investment in range improvements

Range betterment funds

Category "I": Improve Existing Resource Conditions

An "I" allotment is classified as an intensive management area in the MFP, and the allotment analysis has identified a need for improving the existing resource conditions.

Factors

Range condition is not satisfactory.

Range condition has been rated poor to fair.

Trend is apparently static or downward.

Present levels of management are not adequate to meet the long-term resource objectives.

Livestock distribution problems have been identified.

Distribution of livestock use is not uniform. Portions of the allotment are overused while other areas receive very limited use. More than 20% of the allotment may be classified as potentially suitable for livestock grazing.

Allotment Categories and Grazing

Period of use, forage utilization, and numbers of livestock are not in conformance with the multiple-use objectives set for the allotment.

Present management practices do not provide for improving range condition.

The allotment has a moderate to high resource production potential and is producing at low to moderate levels.

Less than 30% of the allotment is classified as unsuitable for livestock grazing because of slope, topography, or low forage production.

Allotment analysis identified serious grazing-related resource conflicts on the allotment.

Forage production is not adequate to meet the needs of all grazing animals on the allotment. The present levels of livestock use and the management objective levels of other grazing animals cannot be accommodated.

Livestock grazing conflicts with other consumptive and non-consumptive resource values on the allotment.

Opportunities exist for positive economic return on public investments.

The public lands are blocked or intermingled with other lands and provide an opportunity for multiple-use management.

Management Actions

The BLM's immediate management objective will be to implement actions that will improve current range condition and productivity and enhance multiple use.

Livestock use would be adjusted as needed to meet management objectives.

Range improvements will be authorized and installed to meet management objectives.

The BLM will conduct variable (up to high) intensity use supervision and monitoring. Monitoring will evaluate the effectiveness of actions taken toward achieving management objectives.

Principal Sources of Funding

Private investment in range improvements

Range betterment funds

Funding appropriated under FLPMA and PRIA

Category "C": Custodial Management

A "C" allotment is outside the intensive management areas, and allotment analysis has revealed that federal multiple use management opportunities are not available.

Factors

Present range condition is not an allotment analysis factor.

Present management is satisfactory, or it is the only logical practice under existing resource and land ownership conditions.

Resource production on the allotment is variable.

More than 30% of the allotment may be classified as unsuitable because of low forage production potential.

Serious grazing-related resource conflicts have not been identified.

Livestock grazing does not have significant adverse impacts on legislatively protected or mandated resources such as endangered species or critical wetland riparian on the allotment.

The allotment is not critical to any renewable resource program.

Opportunities for positive economic return on public investment do not exist or are constrained by technological or economic factors.

The land ownership pattern is such that there is no opportunity for intensive management for one or more of the following reasons:

Land ownership pattern consists of isolated noncontiguous tracts of federal land.

Noncompatible land use (for example, R&PP, sale, or other disposal actions) exist or are imminent.

Management Actions

The BLM's short-term management objective will be to manage the land in a custodial manner by authorizing grazing use at the level needed to prevent deterioration of present resource conditions or development of multiple-use conflicts.

BLM will conduct low intensity use supervision and monitoring. Monitoring will focus on changes in ownership or livestock operations.

Flexibility of turnout and removal dates and numbers of livestock will be prescribed through consultation.

Range improvements will be authorized to meet management objectives.

The BLM will cooperate with SCS or other resource agencies to develop ranch plans on an allotment-by-allotment basis.

Principal Sources of Funding

Private investment in range improvements

Allotment Categories and Grazing

GRAZING MANAGEMENT

Implementation of Changes in Allotment Management

An AMP is commonly used to present in detail the types of changes required in an allotment and to establish a schedule for implementation. The following sections contain discussions of the types of changes likely to be recommended in activity plans and the guidance that applies to these administrative actions.

Livestock Use Adjustments

Livestock use adjustments are most often made by changing one or more of the following: the kind or class of livestock grazing an allotment, the season of use, the stocking rate, or the pattern of grazing. While most livestock use adjustments will occur in the "I" allotments, use adjustments are permitted for allotments in categories "C" and "M".

AUM figures do not represent final stocking rates; rather, all livestock use adjustments will be implemented through documented mutual agreement or by decision. When adjustments are made through mutual agreement, they may be implemented after a public review period for a rangeland program summary. When livestock use adjustments are implemented by decision, the decisions will be based on operator consultation, range survey data, and monitoring of resource conditions. Current BLM policy emphasizes the use of a systematic monitoring program to verify the need for livestock adjustments proposed on the basis of one-time inventory data. Monitoring also will be used to measure the changes brought about by new livestock management practices and to evaluate the effectiveness of management changes in meeting stated objectives.

The federal regulations that govern changes in allocation of livestock forage provide specific direction for livestock use adjustments that are implemented by decision (43 CFR 4110.3-1 and 43 CFR 4110.3-2). The regulations specify that permanent increases in livestock forage "shall be implemented over a period not to exceed five years ..." and that decreases in livestock forage "shall be implemented over a five-year period." The regulations provide for decreases to be implemented in less than five years when: (1) the downward adjustment is 15% or less of the "authorized active grazing use for the previous year," (2) an agreement is reached to implement the adjustment in less than five years, or (3) a shorter implementation period is needed to sustain resource productivity.

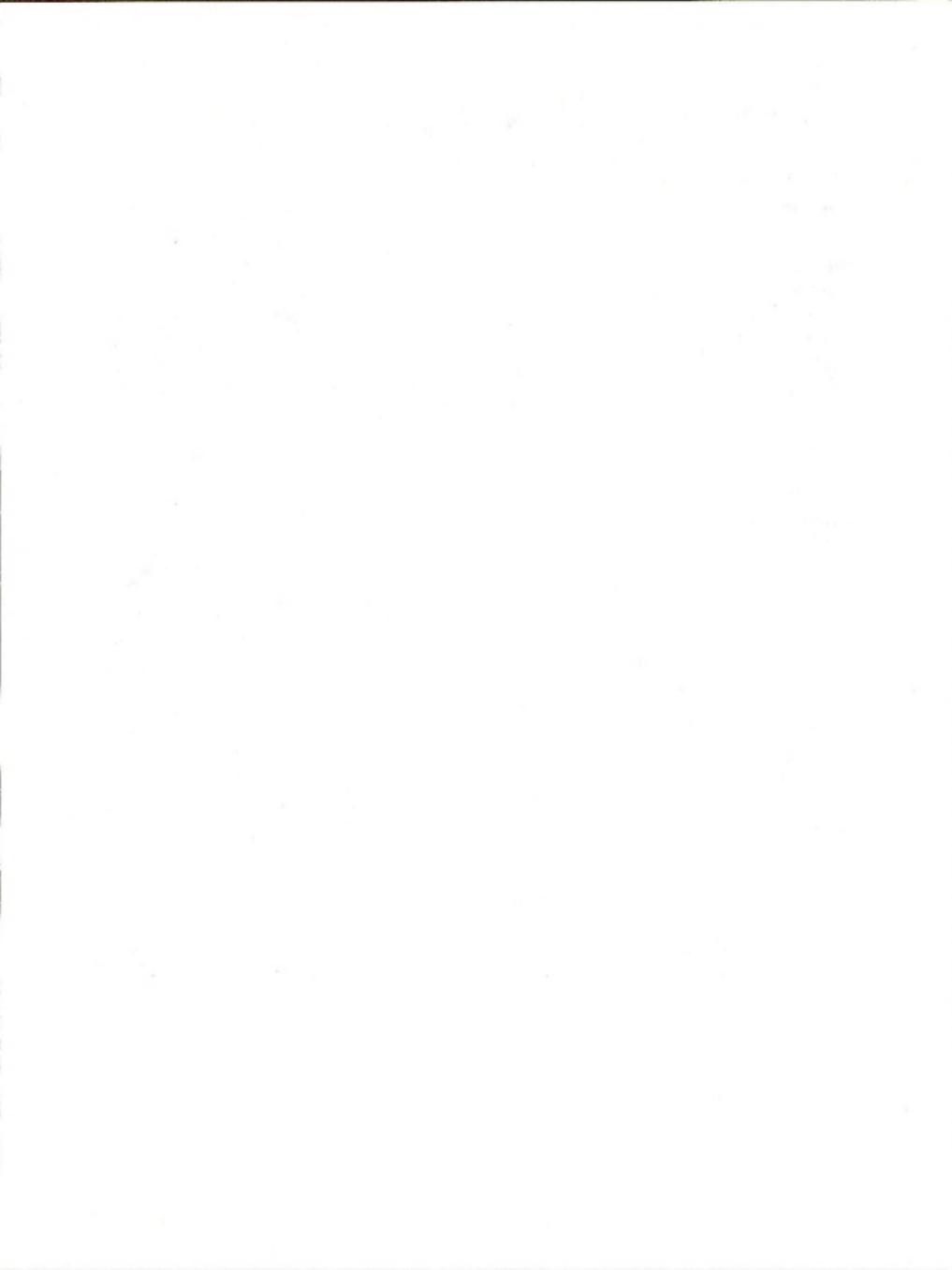
Range Improvements and Treatments

Range improvements and treatments will be implemented under all alternatives. The extent, location, and timing of such actions will be based on the allotment-specific management objectives adopted through the resource management planning process, interdisciplinary development and review of proposed actions, operator contributions, and BLM funding capability.

All allotments in which range improvement funds are to be spent will be subject to an economic analysis. The analysis will be used to develop a final priority ranking of allotments for the commitment of the range improvement funds that are needed to implement activity plans. The highest priority for implementation generally will be assigned to improvements that provide the greatest return for funds invested.

Unleased Tracts

Unleased tracts generally will remain available for further consideration for authorized grazing, as the BLM grazing regulations provide (43 CFR 4110 and 4130).



APPENDIX 4: DETAILS OF IMPLEMENTING EXISTING DECISIONS

Introduction

The details of the implementation of the no action (Alternative A) decisions outlined in this appendix are from various BLM documents. The pertinent documents, with their identifying abbreviations, are listed in chapter 2 and are summarized in appendix 5.

The following Buffalo Resource Area programs are covered in this appendix: fire management (IFMP, FMP); forest management (THP, BMFP); grazing management (NWC); lands and realty (PB, BMFP); minerals (oil and gas—BOG; salable minerals—MMDP); recreation and visual resource management (MFRMP), and wildlife habitat management (ADC).

Forest Management

Access Needed

Listed below are the legal descriptions of access required to implement the timber harvest plan (THP).

Poison Creek

T48N, R84W, Sections 27, 28, 34, 35, and 36
T48N, R83W, Section 31

The "Horn"

T47N, R83W, Section 31
T48N, R84W, Sections 32 and 33
T47N, R84W, Sections 3, 4, 10, 14, 15, 23, 25, 26, and 36
T48N, R84W, Sections 1 and 2
T46N, R83W, Sections 4, 5, 6, 9, 20, 28, 29 and 33

Bull Creek

T47N, R84W, Sections 13, 14, 15, 24, 25 and 26
T47N, R83W, Sections 16, 17, 19, 20, 29 and 30

Red Springs Reservoir

T45N, R84W, Section 6
T46N, R84W, Sections 31 and 32

Pack Saddle Canyon

T45N, R84W, Section 6
T46N, R84W, Sections 32 and 33

Arndt

T45N, R84W, Sections 17, 18 and 19
T45N, R85W, Section 12

Gardner Mountain

T44N, R84W, Sections 2 and 3

Lost Creek

T46N, R85W, Section 15

Lower Beartrap

T45N, R85W, Sections 2, 11, 14, 23 and 36
T44N, R85W, Section 2

Billy Creek

T48N, R83W, Sections 7, 12, 17 and 18

Upper North Fork and Goldmine

T47N, R85W, Sections 9, 10 and 20

Dull Knife
T44N, R83W, Sections 17, 20, 21, 27 and 28
The "Castle"
T45N, R85W, Sections 32 and 33
Cash Canyon
T45N, R84W, Sections 8, 9 and 10
Hammond Spring
T46N, R84W, Sections 7, 8, 17, and 21
T46N, R85W, Sections 11, 12 and 14

Thinning-Identified Areas

Listed below are the legal descriptions of areas identified for thinning projects (BMFP).

Sawmill Creek
T45N, R85W, Sections 3 and 4

Flisher Springs
T44N, R85W, Sections 7 and 8

Woodsley Cabin
T45N, R85W, Sections 4 and 5

Willow Creek
T45N, R84W, Section 22

Rome Hill
T46N, R85W, Section 6

Upper North Fork
T47N, R85W, Section 17

Horn and Bull Creek
T47N, R83W, Sections 7, 18, 19, 31, and 32
T46N, R83W, Sections 5, 6, 7, and 20
T46N, R84W, Section 12

Mosier Gulch
T50N, R83W, Sections 2 and 3

Baldwin Creek
T44N, R85W, Sections 7 and 8

Laramandy Draw
T45N, R85W, Section 1

Pass Creek
T46N, R85W, Section 22

Planting Projects—Identified Areas

Listed below are the legal descriptions of areas identified and accepted for planting projects (BMFP).

Willow Creek
T45N, R84W, Section 22

Lost Creek
T46N, R85W, Sections 9, 10, and 15

Poison Creek
T48N, R83W, Section 32

Sawmill Creek
T45N, R85W, Sections 9 and 10

Implementing Existing Decisions

Grazing Management

Weed Control-Mitigation

The following mitigating measures are included in stipulations applied to weed control specifications (NWC).

Treated soil will not be moved from treatment sites.

Herbicides will not be applied if the wind is blowing toward water.

Class 1, 2, and 3 waters will be monitored before and after herbicide application. Monitoring will be done monthly and after moderate rainfall (when runoff results). Monitoring plans must be submitted to authorized BLM representatives by the Wyoming Department of Agriculture before herbicide applications. Detection of unacceptable herbicide levels will result in suspension of further treatment pending review by the County Weed and Pest Board, WDA, and BLM.

Water in treatment sites will be analyzed where it collects in ponds used for livestock watering or irrigation.

Weed and pest supervisors will contact authorized BLM personnel to identify potential hydrologic-geologic conditions where groundwater could be contaminated. If such conditions exist in a treatment area, groundwater will be monitored.

Where possible, helicopters carrying herbicides will not cross live water.

Hand application of bead formulation or wick application of liquid formulations will be used rather than applications by backpack or boom sprayers in some riparian zones, particularly in areas with dense stands of willows, cottonwoods or other riparian plant species.

Except when applying herbicides, all vehicles will follow designated roads to avoid destruction of wildlife habitat.

Herbicides will not be applied within 10 feet of nests of ground-nesting birds until hatching has occurred and young birds have left the nest.

Herbicides will not be applied to the strutting/dancing grounds of sage grouse and sharp-tailed grouse during mating activities.

Aerial application plans must be submitted to the BLM prior to application.

Aerial applications will be under the direct supervision of weed and pest supervisors who have completed at least one course in aerial application training.

Those administering aerial applications will be certified according to the Wyoming Environmental Pesticide Control Act.

Aerial spraying will be stopped at the end of each spray run and as the craft is turning to reposition for another run. Spray swaths along buffer strips will be parallel to the protected areas and will be sprayed before spraying the rest of the project area.

The weed and pest supervisor will specify the type of aerial spray equipment to be used.

Those applying herbicides will carry copies of herbicide labels.

Those applying herbicides will take care not to disturb non-target vegetation and animal species when off access roads.

Herbicide mixing will be done at least 150 feet away from live water such as streams, lakes, and ponds.

Care will be taken not to contaminate source water when water is obtained for herbicide mixing. For example, vacuum breakers, suction cups or hose can be installed to prevent siphoning if pumps fail.

One week before herbicide application, weed and pest supervisors will notify the Casper District BLM so that a compliance specialist can be on site during operations on public lands. Compliance specialists will be certified according to the Wyoming Environmental Pesticide Act within two years of program approval.

One week before treatment, the BLM will notify the Water Quality Division of the Wyoming Department of Environmental Quality regarding location and date of all herbicide application on public lands.

The Wyoming Department of Agriculture will develop procedures to clean up accidental spills and submit the procedures to the BLM before herbicide application.

Prior to application, weed and pest supervisors and the BLM will coordinate efforts to notify owners of private property adjacent to treatment sites (if the private owner is raising sensitive crops) and stock growers using treatment sites for grazing.

Aerial application will not be made within 100 feet of property boundaries without notification of adjacent land-owners.

Lands and Realty

Pumpkin Buttes-Mitigation

Listed below are mitigating measures that are applied as stipulations for Pumpkin Buttes communication sites (PB).

To ensure maximum site utilization, the BLM will authorize subsequent use rights to present and future site holders and promote the sharing of authorized facilities by noncommercial site holders as their selectable option, but not necessarily for financial gain.

Where operation compatibilities exist for a third party to use the facilities of a primary site holder and this will create no significant changes in the site holder's authorized facilities, the third party may apply to BLM for a right-of-way that may allow him/her to become a subsequent user.

All vehicular travel will be restricted to the designated roadways.

All on-site electrical service will be underground (buried cable) to the point of consumption.

Right-of-way applicants and holders will be encouraged to construct buildings and towers of sufficient size to accommodate additional users and to lease building and tower space in and on these facilities to others. New applicants will be required to rent existing facilities whenever feasible.

The communication site will operate under the "last person in" policy with regard to the resolution of radio frequency interference problems; that is, in the event that a newly permitted operation causes harmful interference or degradation to an existing permittee, the last one in who caused the interference will cease operation until after a satisfactory resolution is obtained. Normally the one whose operation initiated the problem is required to pay for its solution or remove the offending equipment.

Implementing Existing Decisions

Antenna structures (towers) will be of nonreflective, noncorrosive metal with open lattice-type construction. Normally ground-guyed installations no taller than 180 feet above ground level will be used. No painting or lighting will be required. F.A.A. regulations govern when applicable. All permitted towers, regardless of the initial height required, will be designed to be extended later to at least 180 feet above ground.

Solid metal or wood pole-type structures will require special approval and painting.

Towers will be constructed, supported, guyed, and grounded in accordance with specifications that were developed by Rohn Manufacturing Company of Peoria, Illinois, to be applied to environmental conditions on the site.

Antennas, transmission lines, and mounting hardware attached to the tower will be of noncorrosive, nonreflective materials, will be installed consistent with manufacturer's standards and sound engineering practices, and will be maintained in a permanently neat and secure manner.

All transmission lines attached to towers will be equal to or exceed all physical and electronics performance characteristics of Andrew Type LDF4-50 Helian coaxial cable. Inside the equipment building, double-shielded, insulated coaxial cable (industry standard RG/9U or equal) will be used.

So that the number of antenna towers required can be minimized, as many antennas as feasible will be mounted on a single tower. To this end, such equipment as antenna duplexers, combiners, and multicouplers will be used.

Should it become advisable to provide a unified "cone of protection" against lightning damage and reduce susceptibility to radio frequency re-radiation problems, the BLM will coordinate the installation of a common ground system throughout the site complex.

Buildings will be single story or underground; of concrete block, fiberglass, steel, plastic, or wood construction, except that any type of sheet metal or corrugated tin over wood frame is not acceptable.

The use of prefabricated transportable, skid-mounted, fire-resistant buildings is recommended. Buildings such as, or similar to, those manufactured by Armadillo, Fort Worth Tower, and Grasis Fabricating Company are preferred. Insulated steel buildings such as those built by ARMCO, mounted to a concrete slab floor or prebuilt with angular steel beam subfloor and designed for four-point earth anchor, are also good. When conventional residential building materials are used to prefabricate a building for use on this site, fire-resistant insulation and floor, wall, ceiling, and exterior finish material must be used. Externally, all possible access to the area under the building must be adequately sealed off to prevent damage from the possible intrusion of harmful rodents and ignited particles.

All buildings should be rodent proof, insect proof, and essentially dust proof; must be adequately warm, ventilated, and finished; and must be kept clean and neat inside and outside.

Buildings will be of a color that blends with the surroundings, as determined by the BLM.

A maximum number of users will eventually occupy each building. Therefore, a recommended minimal size building would be 8 feet wide, 12 feet long, and 8 feet high.

All buildings will be equipped with lightning protection, so that the building and equipment are adequately protected from major fire damage or loss and so that minor discontinuity of service due to lightning-induced component failures can be reduced.

All electrical wiring and accessories installed in buildings will meet or exceed National Electrical Code standards, being properly grounded and professionally done. All electrical branch circuit runs along or near ignitable surfaces will be in propersized metallic conduit. Circuits to individual equipment will not be loaded in excess of 80% of its breaker protection capacity.

Building accessories should include weatherproof conduit-type entries and raceways for support and routing of RF transmission lines.

All transceiver equipment will be operated and maintained in accordance with either FCC regulations or OTP/IRHC requirements, as appropriate.

All electronic transmitting, receiving, and associated power supply equipment will be enclosed in manufacturer's recommended metal housings to ensure adequate RF shielding.

All electronic equipment will be installed in an orderly professional manner, with appropriate individual lightning protective devices.

Consent of all users operating equipment on the site will be obtained before new users are authorized.

As is practical, users will be expected to work together in solving radio interference and/or site compatibility problems.

Users shall cooperate with the designated BLM area electronics specialist by supplying technical information, when needed, to resolve site use conflicts.

The BLM will, as necessary, upgrade roads to accommodate four-wheel drive vehicles and will provide road maintenance once annually if funding is available. No snow removal is included in maintenance.

Exchanges-Lands Identified

Lands available for exchange in Campbell County under Alternative A are as follows.

T44N, R75W
Section 4, lot 4, SW $\frac{1}{4}$ NW $\frac{1}{4}$
Section 5, lot 1

T45N, R75W
Section 32, SE $\frac{1}{4}$ SW $\frac{1}{4}$
Section 33, SW $\frac{1}{4}$ SW $\frac{1}{4}$

T45N, R76W
Section 6, E $\frac{1}{4}$ W $\frac{1}{4}$

T46N, R75W
Section 18, SE $\frac{1}{4}$ SE $\frac{1}{4}$

T46N, R76W
Section 12, SE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 13, NW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{4}$ NW $\frac{1}{4}$
Section 14, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$
Section 15, SW $\frac{1}{4}$ SW $\frac{1}{4}$
Section 23, W $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$
Section 24, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$
Section 25, N $\frac{1}{4}$ NW $\frac{1}{4}$
Section 27, NE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{4}$ SW $\frac{1}{4}$
Section 33, E $\frac{1}{4}$ SE $\frac{1}{4}$

T48N, R69W
Section 18, lots 1, 2
Section 19, lot 1-4, SE $\frac{1}{4}$ NW $\frac{1}{4}$
Section 30, lots 1, 2

Implementing Existing Decisions

T48N, R70W
Section 12, SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 13, NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 24, E $\frac{1}{4}$ E $\frac{1}{4}$
Section 24, NE $\frac{1}{4}$

T49N, R75W
Section 4, E $\frac{1}{4}$ SE $\frac{1}{4}$
Section 5, NW $\frac{1}{4}$, N $\frac{1}{4}$ S $\frac{1}{4}$
Section 6, E $\frac{1}{2}$
Section 9, E $\frac{1}{4}$ E $\frac{1}{4}$
Section 10, W $\frac{1}{4}$ SW $\frac{1}{4}$
Section 14, N $\frac{1}{4}$ SW $\frac{1}{4}$

T49N, R76W
Section 1, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$
Section 14, NW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 23, SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{4}$ SE $\frac{1}{4}$

T50N, R75W
Section 5, E $\frac{1}{4}$ SE $\frac{1}{4}$
Section 6, S $\frac{1}{4}$ NE $\frac{1}{4}$
Section 9, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{4}$ SE $\frac{1}{4}$
Section 15, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$
Section 31, S $\frac{1}{4}$ NW $\frac{1}{4}$

T50N, R76W
Section 13, N $\frac{1}{4}$ SE $\frac{1}{4}$
Section 21, NE $\frac{1}{4}$ NW $\frac{1}{4}$, W $\frac{1}{4}$ NW $\frac{1}{4}$, SW $\frac{1}{4}$
Section 22, S $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$
Section 26, SE $\frac{1}{4}$ NE $\frac{1}{4}$
Section 33, W $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 34, W $\frac{1}{4}$ SW $\frac{1}{4}$

T51N, R69W
Section 2, lots 1, 2, NW $\frac{1}{4}$ SE $\frac{1}{4}$, E $\frac{1}{4}$ SE $\frac{1}{4}$

T51N, R70W
Section 6, lots 3, 4, SE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{4}$ SE $\frac{1}{4}$

T51N, R71W
Section 1, lots 1, 2, SW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 2, lots 2, 3, SE $\frac{1}{4}$ NW $\frac{1}{4}$

T53N, R76W
Section 14, NE $\frac{1}{4}$ SW $\frac{1}{4}$
Section 24, S $\frac{1}{4}$ SE $\frac{1}{4}$
Section 27, NE $\frac{1}{4}$ NW $\frac{1}{4}$

T53N, R70W
Section 19, lot 4
Section 31, lots 1-4, E $\frac{1}{4}$ SW $\frac{1}{4}$
Section 31, lot 1, NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{4}$ SE $\frac{1}{4}$

T54N, R76W
Section 1, SE $\frac{1}{4}$ SE $\frac{1}{4}$
Section 12, NE $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 24, NW $\frac{1}{4}$ NW $\frac{1}{4}$, S $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$

T55N, R75W
Section 34, SE $\frac{1}{4}$ SW $\frac{1}{4}$

T55N, R76W
Section 25, SW $\frac{1}{4}$ SW $\frac{1}{4}$
Section 26, E $\frac{1}{4}$ NW $\frac{1}{4}$
Section 35, N $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$

T56N, R75W
Section 4, lot 3, S $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{4}$ SE $\frac{1}{4}$
Section 8, SW $\frac{1}{4}$ NW $\frac{1}{4}$
Section 15, S $\frac{1}{4}$ SE $\frac{1}{4}$
Section 27, NW $\frac{1}{4}$ NW $\frac{1}{4}$

Disposal-Lands Identified

Lands that are available for disposal in Campbell County under Alternative A are as follows.

T41N, R76W
Section 24, all
Section 25, NE $\frac{1}{4}$ NE $\frac{1}{4}$
Section 29, E $\frac{1}{4}$ NE $\frac{1}{4}$

T42N, R74W
Section 22, NW $\frac{1}{4}$ SE $\frac{1}{4}$

T42N, R75W
Section 6, SW $\frac{1}{4}$ SW $\frac{1}{4}$

T42N, R76W
Section 20, SE $\frac{1}{4}$ SE $\frac{1}{4}$
Section 21, SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$
Section 24, SW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 29, NE $\frac{1}{4}$ NE $\frac{1}{4}$

T44N, R73W
Section 6, NW $\frac{1}{4}$ SE $\frac{1}{4}$

T45N, R70W
Section 29, NW $\frac{1}{4}$ SW $\frac{1}{4}$
Section 30, lot 3

T45N, R71W
Section 4, E $\frac{1}{4}$ NE $\frac{1}{4}$

T45N, R72W
Section 15, NW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 18, NW $\frac{1}{4}$ NE $\frac{1}{4}$
Section 20, E $\frac{1}{4}$ SE $\frac{1}{4}$
Section 23, NW $\frac{1}{4}$ SW $\frac{1}{4}$

T45N, R73W
Section 2, SE $\frac{1}{4}$ SW $\frac{1}{4}$
Section 21, NW $\frac{1}{4}$ SW $\frac{1}{4}$
Section 33, SW $\frac{1}{4}$ SE $\frac{1}{4}$

T46N, R72W
Section 14, NW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 25, S $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$
Section 26, SE $\frac{1}{4}$ NE $\frac{1}{4}$
Section 31, SE $\frac{1}{4}$ SE $\frac{1}{4}$

T46N, R74W
Section 10, W $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$
Section 11, SE $\frac{1}{4}$ SE $\frac{1}{4}$

T47N, R72W
Section 7, lots 3, 4

T47N, R74W
Section 26, NE $\frac{1}{4}$ SW $\frac{1}{4}$

T48N, R69W
Section 6, W $\frac{1}{2}$
Section 11, W $\frac{1}{4}$ NE $\frac{1}{4}$

T48N, R74W
Section 3, W $\frac{1}{4}$ SW $\frac{1}{4}$
Section 4, E $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$
Section 9, NE $\frac{1}{4}$, E $\frac{1}{4}$ NW $\frac{1}{4}$
Section 10, W $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$

T49N, R69W
Section 20, NE $\frac{1}{4}$ SE $\frac{1}{4}$
Section 22, SE $\frac{1}{4}$ SW $\frac{1}{4}$
Section 31, SW $\frac{1}{4}$ NE $\frac{1}{4}$

Implementing Existing Decisions

T49N, R75W
Section 4, E½SE¼
Section 5, lots 3, 4, S½NW¼, NW½S¼
Section 6, lots 1, 2, S½NE¼, SE¼
Section 9, E½E½
Section 10, W½SW¼
Section 14, NW½SW¼
Section 31, NE½SW¼

T49N, R75W
Section 32, SE½NE¼

T50N, R69W
Section 5, lot 2

T50N, R70W
Section 4, lot 2
Section 15, NW½NW¼
Section 19, NE½SW¼
Section 30, SW½SE¼
Section 34, N½SE¼

T50N, R71W
Section 4, lot 1

T50N, R74W
Section 10, W½NW¼, E½SW¼, NW½SW¼
Section 15, NE½NW¼
Section 20, SE½NE¼
Section 21, SE½SE¼
Section 22, SE½NE¼
Section 23, NE½NW¼, SE½SW¼
Section 27, NW½NW¼

T51N, R69W
Section 22, SE½SE¼
Section 23, SW½SW¼

T51N, R72W
Section 11, NW½NW¼
Section 19, lot 1

T51N, R73W
Section 3, SW½NE¼, SE½NW¼
Section 24, NE½NE¼
Section 30, lot 3
Section 32, N½SE¼, SW½SE¼

T52N, R73W
Section 29, SW½SE¼

T53N, R73W
Section 12, SW½NE¼

T55N, R71W
Section 1, SW½NW¼
Section 2, SW½NE¼, SE½NW¼, NE½SW¼, NW½SE¼,
SW½SE¼
Section 8, NE½NE¼
Section 24, SW½NE¼, E½NW¼, NW½SE¼
Section 25, SW½SE¼
Section 28, NE½SW¼

T57N, R69W
Section 1, NE½SW¼
Section 2, lot 6
Section 17, lot 4
Section 28, lots 5, 6

T58N, R69W
Section 20, lot 8
Section 22, lot 7
Section 24, lot 7
Section 27, lot 1
Section 29, lot 4

T58N, R70W
Section 25, SE½NE¼

Minerals Management

Introduction

Mitigating measures or stipulations attached to permits for surface-disturbing activities are designed to protect the environment by mitigating impacts over a broad geographic area. For oil and gas activities, the places where drill pads and roads will be needed are not known when the lease is issued. At the time the lessee submits an application for permit to drill a well (APD) or applies for a right-of-way, environmental problems pertaining to that individual case must be dealt with. After a field examination of the proposed drilling location or right-of-way, the BLM attaches stipulations to the right-of-way permit or to the APD for protection of the surface resources on BLM-administered lands or where federal lands will be affected.

Mitigating measures that can be applied site-specifically following field inspections to alleviate some adverse impacts have been included in specific EAs such as the Buffalo oil and gas EA. The source documents should be consulted for site-specific application. They will be applied only when and where site conditions warrant their use.

Standard Terms and Conditions for Oil and Gas Leases

The following standard terms and conditions may be applied to leases in the Casper District on a case-by-case basis to deal with specific situations. Where blanks appear, specific numbers, dates, descriptions will be inserted to suit the particular circumstances.

1. All of the land in this lease is included in (recreation or special area, etc.); therefore, no occupancy or disturbance of the surface of the land described in this lease is authorized. The lessee, however, may exploit the oil and gas resources in this lease by directional drilling from sites outside this lease. If a proposed drilling site lies on land administered by the Bureau of Land Management, a permit for use of the site must be obtained from the BLM District Manager before drilling or other development begins.
2. No access or work or road, earth cut or fill, structure or other improvement other than an active drilling rig will be permitted if it can be viewed from the (road, lake, river, etc.).
3. No occupancy or other activity on the surface of (legal subdivision) is allowed under this lease.
4. No occupancy or other surface disturbance will be allowed within _____ feet of the (road, trail, river, creek, canal, etc.). This distance may be modified when specifically approved in writing by the District Manager, Bureau of Land Management.
5. No drilling or storage facilities will be allowed within _____ feet of (live water, the reservoir, etc.) located in (legal subdivision). This distance may be modified when specifically approved in writing by the District Manager, Bureau of Land Management.
6. No occupancy or other surface disturbance will be allowed on slopes in excess of _____ percent without written

Implementing Existing Decisions

approval from the District Manager, Bureau of Land Management.

7. In order to (minimize watershed damage, protect important seasonal wildlife habitat, etc.), exploration, drilling, and other development activity will be allowed only during the period from _____ to _____. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the District Manager, Bureau of Land Management.
8. In order to minimize watershed damage during muddy and/or wet periods, the District Manager, Bureau of Land Management, may prohibit exploration, drilling, or other development. This limitation does not apply to maintenance and operation of producing wells.
9. The _____ (trail, road, etc.) will not be used as an access road for activities on this lease.
10. To maintain esthetic values, all semi-permanent and permanent facilities may require painting or camouflage to blend in with the natural surroundings. The paint selection or method of camouflage will be subject to approval by the District Manager, Bureau of Land Management.
11. One of the following conditions for cultural resources would be applied to each lease. The condition applied depends on a record search.

Cultural Resource Condition 1: The lessees will not disturb the surface of the lease until a cultural resource investigation has been conducted by the BLM or a professional acceptable to the BLM for the specific area on which surface disturbing activity is planned. The results of this investigation will be submitted to the Casper District Manager, BLM, and the BLM will provide terms and conditions for avoidance or salvage of any significant cultural resources. The cost of all investigations and salvage will be borne by the lessee.

Cultural Resource Condition 2: The cultural resource investigation on this lease/permit/right-of-way indicated that significant buried cultural values may be present. However, surface condition of vegetation, snow, or alluvium prevented an adequate evaluation of these cultural resource values. To protect and evaluate these values the permittee/lessee/grantee will engage a professional acceptable to the BLM to observe surface disturbance through specific areas as given. Section _____ Township _____ North, Range _____ West, and a report submitted to BLM District Manager within 30 days of completion of the project. If significant values are observed they will be left intact and the BLM District Manager notified to conduct an evaluation to establish suitable salvage.

Cultural Resource Condition 3: If any cultural values are observed during operation of this lease/permit/right-of-way, they will be left intact and the BLM District Manager notified. The District Manager will conduct an evaluation of the cultural values to establish suitable mitigation or salvage.

The special "wilderness stipulation," which will be attached to leases in the Gardner Mountain, North Fork Powder River, and Fortification Creek areas, contains the following major provisions from BLM's *Interim Management Policy and Guidelines for Lands Under Wilderness Review*.

Activities will be permitted under the lease as long as the BLM determines they will not impair wilderness suitability.

Activities must be temporary, their impacts must be reclaimable, and, after reclamation is complete, the area's wilderness values must not have been degraded.

Use of this stipulation will continue until any or all of the areas listed above are eliminated from further consideration as wilderness.

Disposal Areas for Salable Minerals

Table AP 4-1 indicates the sites that have been designated for free use permits for material sales in the Buffalo Resource Area.

Recreation and Visual Resource Management

Access is to be acquired in the following areas (MFRMP).

- T41N, R83W,
Section 7, NW $\frac{1}{4}$
- T41N, R84W,
Section 11, SE $\frac{1}{4}$
Section 12, S $\frac{1}{4}$
Section 16
- T41N, R85W,
Section 3, NW $\frac{1}{4}$
Section 7, S $\frac{1}{4}$
Section 8, S $\frac{1}{4}$ S $\frac{1}{4}$
Section 9, NE $\frac{1}{4}$
Section 10, SE $\frac{1}{4}$
Section 11, S $\frac{1}{4}$ S $\frac{1}{4}$
Section 16, NW $\frac{1}{4}$
- T41N, R86W,
Section 13, NW $\frac{1}{4}$ NW $\frac{1}{4}$
Section 14, N $\frac{1}{2}$ NE $\frac{1}{4}$
- T42N, R84W,
Section 21, SW $\frac{1}{4}$
Section 30, SE $\frac{1}{4}$ SW $\frac{1}{4}$
Section 31, NW $\frac{1}{4}$
- T42N, R85W,
Section 25, SW $\frac{1}{4}$
Section 26, SE $\frac{1}{4}$
Section 27, N $\frac{1}{2}$ SW $\frac{1}{4}$
Section 28, SW $\frac{1}{4}$ SW $\frac{1}{4}$
Section 29, S $\frac{1}{4}$ SW $\frac{1}{4}$
Section 30, SW $\frac{1}{4}$
Section 31, portion of NW $\frac{1}{4}$ NW $\frac{1}{4}$
Section 34, S $\frac{1}{4}$ SE $\frac{1}{4}$
Section 35, NE $\frac{1}{4}$ NE $\frac{1}{4}$
Section 36, NE $\frac{1}{4}$
- T42N, R86W,
Section 25, S $\frac{1}{4}$ S $\frac{1}{4}$

Implementing Existing Decisions

TABLE AP 4-1
SITES DESIGNATED FOR DISPOSAL OF SALABLE MINERALS
IN THE BUFFALO RESOURCE AREA

Sites Designated for Free Use Permits

Johnson County Sand and Gravel	Campbell County Scoria
T43N, R79W, Section 4: SE1/4; Section 7: WL/2WL/2 Section 9: NE1/4	T45N, R71W, Section 31: E1/2 Section 32: WL/2WL/2 T45N, R72W, Section 14: SW1/4 Section 15: SE1/4 Section 23: SW1/4 Section 26: NW1/4
T43N, R80W, Section 11: SW1/4 Section 12: E1/2 T43N, R81W, Section 9: NW1/4, E1/2NE1/4 Section 10: S1/2NW1/4 Section 11: NL/2SE1/4, NE1/4SW1/4	Campbell County Sand and Gravel
T43N, R83W, Section 34: SW1/4SE1/4 T45N, R82W, Section 2: SW1/4, WL/2SE1/4 Section 3: S1/2NL/2 Section 4: NL/2NL/2, SW1/4NW1/4, SE1/4NE1/4 Section 9: S1/2NW1/4, NE1/4NW1/4, NE1/4, S1/2 Section 10: S1/2NL/2, NL/2NW1/4 T47N, R82W, Section 3: S1/2 Section 9: S1/2NW1/4, NL/2SW1/4, E1/2NE1/4 Section 10: NW1/4	T45N, R73W, Section 15: SW1/4, EL/2SW1/4 Section 22: NL/2NE1/4 T46N, R71W, Section 20: T46N, R72W, Section 26: NE1/4NE1/4 Section 27: NL/2SE1/4NE1/4

Sites Designated for Competitive Sales

Johnson County Sand and Gravel	Campbell County Sand and Gravel
T49N, R80W, Section 7: NE1/4NW1/4	T44N, R71W, Section 6: WL/2
T49N, R81W, Section 5: WL/2, NE1/4 Section 6: EL/2NW1/4, WL/2NE1/4, WL/2SE1/4	T46N, R72W, Section 26: SE1/4NE1/4
T50N, R81W, Section 32: EL/2SW1/4, SE1/4 Section 33: WL/2SW1/4, SW1/4NW1/4	Campbell County Scoria
T49N, R82W, Section 3: SE1/4, except for SE1/4SE1/4 Section 5: WL/2 Section 6: NL/2NE1/4, SE1/4NE1/4 Section 11: NW1/4	T46N, R71W, Section 9: SE1/4NW1/4, NE1/4SW1/4, SW1/4NE1/4

Sites Designated for Negotiated Sale

Johnson County Moss Rock (decorative stone)

T45N, R84W, Section 25: S1/2 Section 26: SE1/4
T46N, R85W, Section 4: EL/2EL/2 Section 9: EL/2NE1/4 Section 10: SW1/4, SW1/4NW1/4 Section 22: WL/2EL/2 Section 26: NE1/4 Section 27: NE1/4NE1/4
T47N, R85W, Section 28: EL/2EL/2 Section 33: EL/2EL/2

Implementing Existing Decisions

Wildlife Habitat Management (Animal Damage Control)

The following animal damage control restrictions from the animal damage control plan (ADC) will be applied throughout the resource area.

"No Control" Areas

"No control" areas are human safety zones. No predator control activities are allowed within these zones unless control in an individual case is approved by the Casper District Manager. "No control" areas are as follows:

- Within 1 mile of any residence unless the occupant requests or approves control activities or devices closer
- Within 1 mile of any community
- Within $\frac{1}{2}$ mile of any federal or state highway
- Within 1 mile of any developed recreation sites, trails, parks, rest areas, or similar areas

Limited control areas are areas in which certain control methods will not be allowed at all or will not be permitted during specific periods of the year for such reasons as human safety or wildlife needs. Specific limited control areas in the Buffalo Resource Area are as follows:

- Petrified Tree Area (T51N, R60W). No control except aerial gunning.
- Billy Creek Area (T48N, R83W). No control except aerial gunning.
- Ed O. Taylor Game Range (Ts 41 and 42N, Rs 84 and 85W). No control without WGFD approval.
- Reasonable effort should be made to avoid repetitive disturbance of wintering big game herds wherever they are encountered. Caution should be exercised in areas of known bald eagle concentration.

Active Control Areas

Except as described above, active animal damage control is permitted on public lands. The USFWS is authorized to conduct animal damage control (ADC) activities for the control of predators by whatever methods the service is internally authorized to use, provided the USFWS has on file a current request from the livestock operator(s) in the allot-

ment(s) concerned. A current request is one made by the livestock operator(s) within 30 days before control activities begin. This requirement will help to ensure that ADC activities are aimed at offending animals or populations rather than at species as a whole.

Special Situations

In areas of no control or limited control, emergency situations may arise that require control in "no control" areas or the use of methods other than those approved in other areas. The USFWS may respond to these situations but must notify and receive approval from the BLM district manager before beginning control operations, if possible. If the situation requires immediate action, USFWS may respond without prior approval but must notify the district manager within 48 hours after control is initiated and when it is completed. Documentation of emergency response activities will be completed as for normal control activities. Once the emergency situation is over, the area will revert to its prior status of no control or limited control, as appropriate.

M-44s (cyanide guns) will be used only in accordance with USFWS policy and all current Environmental Protection Agency regulations and restrictions on their use. M-44s are to be used on public lands only as authorized case by case by the Casper District manager. Such authorization will be given only when the following actions have been completed:

The livestock operator has submitted a written request to the USFWS for use of M-44s

The USFWS has completed an evaluation of the need for M-44s and has made a positive finding. In each case, documentation of livestock losses, including evidence that such losses were caused by predators, is required.

The Wyoming Game and Fish Department has been apprised of the situation and has approved the use of M-44s.

Only USFWS employees will place M-44s on public lands. The USFWS will inform the Casper District manager of the number and location of each M-44 device.

USFWS personnel in "hot pursuit" of a target animal may pursue it into a no control or limited control area unless an obvious conflict would occur, such as approaching a dwelling or flying over a wintering elk herd.

The Casper District manager can restrict or prohibit any ADC activity on public land at any time for substantial reason.

The use of chemical toxicants for predator control will conform to all federal, state, and local regulations. No toxicant will be used on public land without prior BLM clearance for pesticide use on public land.

APPENDIX 5: SUMMARY OF SOURCE DOCUMENTS

INTRODUCTION

Existing land use decisions are the basis for the "no action" alternative of this RMP/EIS. Every decision was considered from the management framework plans (MFPs) and from activity plans and environmental assessments prepared for the Buffalo Resource Area. Decisions that were duplicated or were not in accordance with current laws, regulations, and policy were dropped. Those that are standard operating procedure were not included in the description of the alternative but will be routinely implemented as a matter of policy. Decisions that came through that screening process are included in the description of the "no action" alternative.

MFPs were completed for the Eastern Powder River Basin (Campbell County) in 1977 and for the Western Powder River Basin (Sheridan and Johnson counties) in 1979. For easier use, these plans were consolidated into one document called the "Buffalo Management Framework Plan" (BMFP). The other sources for the "no action" alternative are listed in the next section, along with the abbreviations that are used for each in this document. A summary of the objectives and alternatives considered in each document follows the list.

SOURCES OF MITIGATING MEASURES

The planning decisions in the source documents are superseded by the decisions in the RMP alternatives. The site-specific mitigating measures identified in the source documents will be carried out as applicable following a site analysis.

The following list indicates the source documents in which applicable mitigating measures are described and the alternatives to which those mitigating measures apply.

ADC. Plan and EA for animal damage control (USDI, BLM 1983a, 1983b). Alternatives A, B, C, D.

BOG. Buffalo oil and gas EA (USDI, BLM 1980b). Alternatives A, B, C, D.

CS. Corridor study, Eastern Powder River Basin, Wyoming (USDI, BLM 1977b). Alternatives A, B, C, D.

DC. Recreation management plan and EA for Dry Creek Petrified Tree Outstanding Natural Area (USDI, BLM 1978b, 1978c). Alternatives A, B, C, D.

DPD. Forest development plan for the south Bighorns (USDI, BLM 1981c). Alternative A.

FMP. Fire management plan for Middle Fork management area (USDI, BLM 1982e). Alternatives A, B, C, D.

FOG. Oil and gas surface protection plan for Fortification Creek area (USDI, BLM 1982i). Alternatives A, B, C, D.

GRA. Gillette Review Area MFP coal amendment (USDI, BLM 1980a). Alternative A.

HRA. Highlight Review Area MFP coal amendment (USDI, BLM 1980i). Alternative A.

IFMP. Interim fire management plans for North Fork, Fortification Creek, and Gardner Mountain WSAs (USDI, BLM 1982f, 1982g, 1982h). Alternative A.

MFHMP. Middle Fork Powder River habitat management plan and EA (USDI, BLM 1980d, 1980g). Alternatives A, B, C, D.

MFRMP. Recreation management plan and EA for Middle Fork Powder River (USDI, BLM 1980h, 1981d). Alternatives A, B, C, D.

MMDP. Johnson County and Campbell County salable mineral materials disposal plans (USDI, BLM 1980f, 1982k). Alternatives A, B, C, D.

MMDPEA. Combined EA and technical report for Campbell and Johnson counties mineral disposal plans (USDI, BLM 1980c). Alternatives A, B, C, D.

NWC. Decision record and EA for Casper District noxious weed control program (USDI, BLM 1982b). Alternatives A, B, C, D.

ORV. Johnson County ORV EA and implementation plan (USDI, BLM 1981f). Alternative A.

PB. Management plan and EA for Pumpkin Buttes Communication Site (USDI, BLM 1982c, 1982j). Alternatives A, B, C, D.

RPP-C. EA for Campbell County Community Park R&PP Lease (USDI, BLM 1978a). Alternatives A, B, C, D.

RPP-S. EA for Sheridan County Regional Recreation Complex R&PP Lease EA (USDI, BLM 1979c). Alternatives A, B, C, D.

RRA. Recluse Review Area MFP coal amendment (USDI, BLM 1982a). Alternative A.

SBAP. South Bighorn access plan (USDI, BLM 1982i). Alternative A.

THP. Ten-year timber harvest program for the south Bighorns (USDI, BLM 1982m). Alternatives A, B, C, D.

WPRB. Western Powder River Basin MFP coal amendment (USDI, BLM 1981a). Alternative A.

SUMMARIES OF DOCUMENTS

Animal Damage Control Plan

The following section summarizes the plan and EA for animal damage control (ADC) (USDI, BLM 1983a, 1983b).

The objective of the ADC plan was to allow the USFWS to conduct a mammalian predator control program on BLM-administered public land in the

Source Documents

Casper District. The proposal conforms to existing and draft planning documents.

Two alternatives were considered. Alternative 1 consisted of the existing program without site-specific restrictions on dates and types of control. Alternative 2 included a number of site-specific restrictions on the program intended to lessen the potential for conflict with other public land uses. Alternative 2 was the preferred alternative.

Alternative 2 was selected because it would allow the USFWS to continue its ADC program on public land in the Casper District, emphasizing the need for human safety considerations and certain environmental concerns.

The USFWS prepared an EIS on the western mammalian animal damage control program. This EIS analyzed the impacts of the program in an adequate manner, and it would have been adequate for the BLM's purposes except that it did not contain the needed site-specific considerations. The ADC EA rectifies that deficiency.

Other factors that have a bearing on the selection of Alternative 2 include the fact that public lands in the Casper District are intermingled with private and state lands. Exclusion of ADC work on public lands would have greatly complicated ADC efforts on private or state lands. In addition, predation is a significant drain on area livestock operations, and exclusion of ADC work probably would have caused unnecessary financial hardship on livestock operators.

Buffalo Oil and Gas

The following section summarizes the Buffalo oil and gas EA (BOG) (USDI, BLM 1980b).

Objectives

The objective of the EA was to provide management guidance for BLM decisions leading to the orderly development of federal mineral resources under federal jurisdiction so that energy fuels can be produced to help meet the national demand. In particular, the EA identified areas for future oil and gas leasing, areas where leasing should be subject to special provisions, and areas where there should be no oil and gas leasing. It also identified mitigating measures that could be used to prevent or reduce damage to the environment.

Alternatives

The proposed action was to issue oil and gas leases with appropriate environmental protection constraints such as those listed in the management framework plan.

Alternative 1 would have modified current environmental protection restrictions on oil and gas leasing by increasing the intensity of the criteria, thereby reducing the area available for leasing.

Alternative 2 recommended increasing the number and intensity of environmental protection restrictions on oil and gas leasing to the extent that no new leasing would occur in the resource area.

Alternative 3 recommended reducing the current number of environmental protection restrictions on oil and gas leasing, opening more areas to leasing than under the proposed action.

Alternative 4 recommended leasing oil and gas without restriction. Stipulations would not be prepared until applications for surface-disturbing activities were submitted.

Rationale

Alternative 1 was selected because it represented the best mix of environmental enhancement and protection, energy development, and public needs while providing maximum environmental protection consistent with the need for energy production.

In addition to leasing, the EA analyzed all support requirements, both on and off lease sites, that would be necessary for development of a lease, and it identified impacts of geophysical exploration. Off-lease developments are rights-of-way for roads, power lines, pipelines, and other related activities associated with lease development. On-lease developments include tank batteries, reserve pits, disposal pits, storage areas, and related facilities.

Corridor Study

The following section summarizes the Corridor study, Eastern Powder River Basin, Wyoming (CS) (USDI, BLM 1977b).

Objective

This study was initiated in June 1977 in direct response to a BLM land use planning decision to

Source Documents

work with federal, state, county, and private interests to identify the best locations for corridors for major energy transmission and transportation systems. The purpose of the study was to consider the environmental and socioeconomic viewpoints and, after identification of sites, to encourage location of new energy transmission and transportation rights-of-way within the identified corridors.

Alternatives

Although the document listed no alternatives, alternatives of "with corridors" and "without corridors" were implied.

Briefly stated, the main recommendation of the study was that new energy transmission or transportation facilities that would cross one or more boundaries of the planning area must consider locating within a compatible distance of existing facilities. This policy would apply to facilities that met any of the following criteria:

Power lines: Any line with an "H" type structure or larger.

Pipelines: Any lines 6 inches in diameter or larger, regardless of volume.

Highways: Major collector highways.

Railroads: All main railroad lines leading out of the planning area.

In effect, this recommendation would establish corridors around existing facilities. New corridors would be considered only when location within a compatible distance of existing facilities could be demonstrated to be impractical and unfeasible, and where the environmental impact could be mitigated.

Rationale

If only the environment is considered, the corridor concept is a satisfactory method of limiting impact on the environment of Campbell and Converse counties. The corridor concept would protect the surrounding environment and allow it to be kept in its natural state.

Dry Creek Area

The following section summarizes the recreation management plan and EA for Dry Creek Petrified Tree Outstanding Natural Area (DC) (USDI, BLM 1978b, 1978c).

Objectives

The objectives of this plan were to ensure compliance with the MFP decision and to manage the 40-acre Dry Creek site in a manner that would ensure that the resources would be conserved, enhanced, developed, and used in the public interest. Specific objectives were as follows:

To preserve the ecosystem as near to its natural state as is feasible.

To protect the area from exploitation, vandalism, and destructive human elements.

To heighten the users' awareness and understanding of the resource through education.

To cause visitors to identify with the land so that a feeling of personal commitment for its care develops.

Alternatives

The proposed action was to manage the Dry Creek Petrified Tree Site as an Outstanding Natural Area. This would include a self-guiding trail system interpreting geology, paleontology, vegetation, wildlife, and archeology; a parking area; vault toilet; picnic tables; benches; and trash receptacles. The excavated stump would be rehabilitated with polyvinyl acetate beads, and the road leading to the stump would be rehabilitated by reseeding and by water bars. This alternative was selected.

A second alternative called for intensive development of the site for general recreation use with water and overnight camping facilities. This would have jeopardized the protection of the site as an Outstanding Natural Area.

Under the "no action" alternative, the Dry Creek area would not have been managed.

Rationale

Management of the Dry Creek site as an Outstanding Natural Area will ensure protection of an ecosystem in its natural state and benefit public use for research and education. Development of an interpretive trail system will help protect the area from exploitation, vandalism, and other destructive human elements by causing visitors to identify with the site so that a feeling of personal commitment for its care develops.

Source Documents

Forest Development Plan

The following section summarizes the forest development plan for the south Bighorns (FDP) (USDI, BLM 1981c).

The objective of the plan was to identify specific forest stands where planting and thinning projects could be initiated in order to optimize the productive capacity of these lands. The plan was prepared to update the existing South Big Horn forest management plan.

No alternatives were presented in the plan. However, priorities were assigned to the proposed planting and thinning areas on the basis of the projected rate of return anticipated from each project.

The proposed forest development plan was approved in support of the resource area annual allowable cut. No site-specific impacts were expected to be associated with the approved planting and thinning projects identified in the forest development plan.

Fire Management Plan

The following section summarizes the fire management plan for Middle Fork management area (FMP) (USDI, BLM 1982e).

The overall objectives of this plan were to minimize fire losses and damages to various resources, particularly wildlife, livestock, recreation, and property; to prevent human-caused fires; and to allow fire to be used in its natural role to meet management objectives.

This plan set forth guidelines for the management of fires occurring on or threatening public lands within the Middle Fork management area. Presuppression, suppression, rehabilitation, and prescribed burning were addressed.

No alternatives were considered in this plan.

Fortification Creek Oil and Gas Plan

The following section summarizes the oil and gas surface protection plan for Fortification Creek area (FOG) (USDI, BLM 1982i).

The objective of this plan was to afford the opportunity for orderly development of an area unmarked by oil and gas activities except for seven dry holes and associated roads.

The area covered by the Fortification Creek oil and gas plan includes wilderness study area WY-060-204, the Fortification Creek WSA. No new alternatives were considered in this plan; however, it was correlated with several other plans, including the Johnson County ORV plan (USDI, BLM 1981f), Interim fire management plan (USDI, BLM 1982f), and the Buffalo oil and gas EA (USDI, BLM 1980b). The section of the oil and gas plan that deals with development of oil and gas within the WSA is in compliance with the BLM's *Interim Management Policy and Guidelines for Lands Under Wilderness Review* (USDI, BLM 1979a).

The actions proposed in this plan are addressed in the *Buffalo Resource Area Oil and Gas Environmental Assessment* (USDI, BLM 1980b) and the *Interim Management Policy for Fortification Creek WSA* (USDI, BLM 1981e). Both of these documents are on file in the Buffalo Resource Area office.

This plan was needed because as the demand for petroleum products grows, exploration and development are entering into land areas of critical resource values. Since critical areas like the Fortification Creek area are largely unmarked, plans must be developed to provide that the exploration and development activities progress in an orderly manner while affording protection for the surface resources.

Gillette Review Area Coal

The following section summarizes the Gillette Review Area MFP coal amendment (GRA) (USDI, BLM 1980a).

The specific objectives of this amendment were as follows:

To identify lands acceptable for further consideration for competitive coal leasing by applying the coal screening process as described in 43 CFR 3420.

To process coal preference right lease applications. The PRLAs were evaluated for compatibility with land use plans and for suitability for coal mining. During this amendment process, 13 of the 60 PRLAs in the Casper District were considered.

To identify opportunities for exchanges of uncommitted federal coal for existing federally issued leases or PRLAs in environmentally sensitive areas.

Source Documents

No alternatives were considered in this amendment. At the time it was written, alternatives were not required for MFP amendments.

Highlight Review Area Coal

The following section summarizes the Highlight Review Area MFP coal amendment (HRA) (USDI, BLM 1980).

The objectives of this amendment were similar to those of the Gillette Review Area amendment.

This document was prepared as a supplement to the multiple use decisions on coal development in the Eastern Powder River Basin. There were no alternatives. At the time the amendment was written, alternatives were not required for MFP amendments.

Interim Fire Management for WSAs

The following section summarizes the interim fire management plans for North Fork, Fortification Creek, and Gardner Mountain WSAs (IFMP) (USDI, BLM 1982f, 1982g, 1982h).

These plans cover management of fires occurring in or threatening lands in the WSAs until Congress makes a decision for each WSA as to designation or nondesignation as wilderness. Presuppression, suppression, and rehabilitation are addressed. Each plan will remain in effect until one of the following situations occurs:

The unit is dropped from wilderness consideration. Fire management will then revert to standard operating procedures or plans, or

The unit is designated wilderness and added to the National Wilderness Preservation System. A fire management plan will then be written to conform with the BLM's wilderness management policy.

No alternatives were considered in these plans.

Middle Fork HMP

The following section summarizes the Middle Fork Powder River habitat management plan and EA (MFHMP) (USDI, BLM 1980d, 1980g).

This plan was prepared because crucial wildlife values are present in the Middle Fork area and

because of potential problems in maintaining wildlife habitat in the face of increasing demand for other land uses such as mineral development, uncontrolled recreational use, excessive livestock grazing, and timber harvesting.

The objectives of the document were to maintain and improve habitat for big game, small game, and nongame species, as well as riparian and fisheries habitat.

An alternative to the above was to allow other present and future land uses to continue unrestricted in the management area ("no action").

The preferred alternative (habitat management) was chosen because the wildlife values were determined to be the highest and best use in the area, and unregulated use would degrade these values. Mule deer and elk population goals would be accomplished under the selected alternative, and various habitat types important to maintenance of the ecosystem would be maintained.

Middle Fork Recreation

The following section summarizes the recreation plan and EA for Middle Fork Powder River (MFRMP) (USDI, BLM 1980h, 1981d).

Objectives

The objectives of the MFRMP were as follows:

To protect the resource values in the management area from further deterioration through control of visitor and ORV use.

To provide permanent access and to relieve or reduce conflict on private land through access acquisition, exchange, or a combination of both.

To protect important resource values in the Middle Fork Management Area by applicable withdrawal.

To determine the extent and significance of the cultural resources in the management area.

Alternatives

Proposed Action

The proposed action, which was the alternative selected, included the following steps.

Lands in the immediate vicinity of the Ed O. Taylor Big Game Winter Range and a 1/2-mile buffer near the canyon and stream where there

Source Documents

are federal minerals would be withdrawn from entry under the 1872 Mining Law.

An environmental assessment for an ORV designation for Johnson County was completed in the summer of 1981. An access plan is being prepared.

Oil and gas leasing in the management area was addressed in the Buffalo Resource Area Oil and Gas EA (USDI, BLM 1980b).

Fencing would be installed across existing drainages and topography to prevent livestock from drifting down to and congregating along the Middle Fork River.

Acquisition of critical tracts of private surface through exchange would be sought: 2,200 acres from Willow Creek Ranch and 160 acres from Ellis Sheep Company.

No Action

The "no action" alternative would have included the following steps.

Continued livestock grazing would have been allowed along the Middle Fork River. This would have affected fish populations.

Acquisition of access would not have been sought.

Partial Implementation

An alternative for partial implementation recommended development of acceptable livestock grazing systems that would have allowed vegetation condition to improve and stabilize the stream bank.

Rationale

The proposed action was selected for the following reasons.

Significant public values have been identified on all of the mineral estate identified for withdrawal. Mining under the 1872 law would gravely affect these public values.

Public use of the area is increasing rapidly. ORV damage is occurring and must be controlled. All public land must be inventoried for ORV designations by 1987. Access plans will be formulated in conjunction with ORV designations.

Oil and gas leasing pose a threat to the recreational, cultural, and wildlife values found in the

area. Special stipulations are required to protect these values.

Fencing would stop livestock grazing along the Middle Fork River, which is causing degradation to the stream bank through increased bank sloughing and siltation downstream. Livestock management options such as specifying the time of year, numbers, and kinds of livestock have not proven effective in preventing stream bank degradation.

The acquisition of access is of such importance to the management area that proper management would not be feasible without it. Land acquisition would benefit both recreation and wildlife. Exchange is the best method for obtaining this land. If this should become impossible because of previous land sales, easements would be the next best alternative.

Mineral Material Disposal Plans

The following section summarizes the Johnson County and Campbell County salable mineral materials disposal plans (USDI, BLM 1980f, 1982k). The designation "MMDP" in this RMP/EIS refers to both plans.

The objectives of these plans were as follows:

To identify the location and reserves of federally owned sand and gravel, crushable rock, and "clinker" (scoria) within an economically feasible radius of transport (approximately 30 miles).

To facilitate disposal of federally owned sand and gravel, crushable rock, and clinker by preparing an EA and a technical report assessing potential impacts of mining these materials at the specific sites identified. The assessment included federally owned deposits that are now outside the economic radius of transport to current areas of use but have potential for supplying future areas of use.

To initiate material sales, with an emphasis on competitive sales where possible, through a program of public contact.

To establish priorities for disposals as follows: (1) state and county highway departments, (2) energy minerals industry needs, such as construction and maintenance of oil field roads and uranium mine surface facilities, and (3) other uses.

To identify trespass sand and gravel or clinker pits in existing oil fields, and through cooperation with the field operator, either to close and rehabilitate

Source Documents

tate pits no longer needed or to issue use authorizations with appropriate rehabilitative stipulations on pits still needed for road maintenance.

No alternatives were addressed in either plan.

Mineral Material Disposal EA

The following section summarizes the combined EA and technical report for Campbell and Johnson Counties mineral disposal plans (MMDPEA) (USDI, BLM 1980c).

Alternatives

The proposed action was to authorize mineral material disposal in accordance with MFP decisions and MMDPs for Johnson and Campbell counties.

An alternative would have denied future applications or renewals for free use permits and materials sales in Johnson and Campbell counties.

The "no action" alternative called for continuing the present method of mineral material disposal in the resource area.

Rationale

The proposed action was selected because it would facilitate the disposal of federally owned mineral material by streamlining the method for processing free use permits and material sales.

Noxious Weed Control

The following section summarizes the decision record and EA for the Casper District noxious weed control program (NWC) (USDI, BLM 1982b).

Objectives

This document was prepared in response to concern about noxious weed infestation on federal lands. The control program had the following objectives:

To reduce present and future economic losses to ranchers, farmers, and the general public caused by reduced crop yields, lowered rangeland productivity, and costly weed control efforts. These losses could be reduced by controlling the designated noxious weeds, which are sources of reinestation on all land.

To comply with state and federal laws. Federal law restricts interstate shipping of contaminated products and addresses itself to weed infestations on federally owned land (Carlson-Foley Act, PL 90-583, and Federal Noxious Weed Act of 1974, PL 63-629). The Wyoming Weed and Pest Act of 1973 applies to all infested land within the state—private, state, or federally owned. Both state and federal laws have quarantine provisions that can be used as enforcement measures.

Alternatives

The proposed Integrated weed management program of the preferred alternative provided an interdisciplinary approach to reduce noxious weed infestations. The program provided for control through preventive, physical, herbicidal, biological, and management practices. Herbicides are the backbone of the proposed action; however, the preventive and management measures are an extremely important part of the weed control program.

The "no action" alternative did not provide for any type of noxious weed control on public land.

The "partial action" alternative would have permitted authorized BLM representatives to use certain components of the proposed action.

An "independent action" alternative would have provided for selection of only one of the weed control components presented in the proposed action. That alternative was considered but not fully analyzed. It was apparent that this alternative was not viable because it would not totally meet the objectives, purpose, and needs of a weed control program on public land.

Rationale

The preferred alternative was selected because it would comply with the provisions of the Wyoming Weed and Pest Act of 1973 and the Federal Carlson-Foley Act (PL 90-583) and was consistent with district planning decisions. It would help to reduce the dispersal of noxious weeds from sources on public land more effectively and with fewer adverse impacts than the other alternatives considered.

Off-Road Vehicle Plan

The following section summarizes the Johnson County ORV EA and implementation plan (ORV) (USDI, BLM 1981f).

Source Documents

The plan was prepared because Executive Orders 11644 and 11989 direct that all public land be designated with respect to ORV use. In addition, 43 CFR 8340 further defines policies and procedures to ensure that ORV use on public lands will be controlled and directed to protect natural resources, promote public safety of all users of the land, and minimize conflicts among land users.

The proposed action was to implement the ORV recreation decisions of the Buffalo Management Framework Plan and to adopt the proposed ORV designation findings. Approximately 22,497 acres were identified for ORV management during the MFP process. ORV designations for the remaining 489,554 acres of public land were determined by Buffalo Resource Area specialists representing multiple use activities that occur on public land.

One alternative would have closed all public lands in Johnson County to ORV use. Access to public land would have been allowed only by means other than motor vehicle.

The "no action" alternative would have continued the present practices. No ORV designations would have been assigned to the public land. This action would be similar to an "open" designation for all ORV activities. This alternative was not considered practical or feasible in light of Executive Orders 11644 and 11989, and it was not analyzed further.

The proposed action was selected. The plan serves as a guide for managers in monitoring and evaluating the present designation, a reference for future redesignation, and a base for determining future actions that may be developed through activity planning. Actions identified in the implementation plan will provide information for broadening ORV users' awareness on designated areas.

Pumpkin Buttes Communication Sites

The following section summarizes the management plan and EA for Pumpkin Buttes Communication Site (PB) (USDI, BLM 1982c, 1982).

Alternatives

The proposed action provided that all rights-of-way must be located on South Middle Butte until such time as this butte has been fully utilized as a communication site. Rights-of-way were not to be permitted on North Butte unless an applicant

could show that no other butte would provide the line of sight needed for the facility.

Rights-of-way would be issued case by case. Applicants would have to obtain permission for access from the private landowner until the BLM obtained an easement. The BLM would obtain easements for the road, maintain the road, and conduct annual inspections.

An alternative to the proposed action would have provided for consideration of the North Butte as a communication site. This mesa is interspersed with private land, so that negotiation with private landowners and coordination with the existing users already located off public land would be required. Access to the site is obtainable physically, through private and public lands, but legal access is not available because an easement over private land is needed.

The "no action" alternative would have allowed the buttes to remain as unmanaged sites, as they have been in the past.

Rationale

The proposed action was selected because it would provide proper management for orderly development and maximum use of the South Middle Butte of Pumpkin Buttes as a communication site.

Growth in an area increases the demand for communications from both outside and inside the county. Adequate sites are few and in remote areas. Uses of these sites would be for telephone, television, microwave, private business, radio, and other public services.

Because Pumpkin Buttes extends some 1,000 feet above the rest of the Powder River Basin floor, it is an excellent location for a communication site. The piecemeal communication facilities in the area needed to be brought under management or eliminated.

Campbell County R&PP Lease

The following section summarizes the EA for Campbell County Community Park R&PP lease (RPP-C) (USDI, BLM 1978a).

An MFP decision recommended that 40 acres of public land be made available to Campbell County for a public purpose or recreational use. The purpose was to provide recreation facilities to accommodate population increases generated by the energy impact.

Source Documents

Alternative 1 recommended issuing the R&PP lease with stipulations designed to protect the environment.

Alternative 2 would not have issued the lease.

Alternative 1 was selected because the analysis illustrated that the subject land was suitable for recreation and public purposes and that the impacts could be mitigated.

Sheridan County R&PP Lease

The following section summarizes the EA for Sheridan County Regional Recreation Complex R&PP lease (RPP-S) (USDI, BLM 1979c).

An MFP decision recommended that 560 acres of public land be made available to Sheridan County for recreation purposes. The purpose was to provide equestrian facilities, a rifle range, and other recreation facilities to accommodate population increases generated by the energy impact.

Alternative 1 recommended issuing the R&PP lease with stipulations designed to protect the environment.

Alternative 2 would not have issued the lease.

Alternative 1 was selected because the analysis illustrated that the subject land was suitable for recreation and public purposes and that the impacts could be mitigated.

Recluse Review Area Coal

The following section summarizes the Recluse Review Area MFP coal amendment (RRA) (USDI, BLM 1982a).

Specific objectives of this amendment were to identify lands acceptable for further consideration for new competitive leasing and to identify lands that could be considered further for possible lease exchange or modification.

No alternatives were considered in this amendment. At the time it was written, alternatives were not required for MFP amendments.

Access to South Big Horns

The following section summarizes the south Bighorn access plan (SBAP) (USDI, BLM 1982i).

The access plan was prepared to support the ten-year timber harvest program for the southern portion of the Big Horn Mountains. Its objective was to identify preliminary access routes and set a schedule for acquisition.

No alternative proposals were presented in the plan.

The proposed access routes were selected on the basis of the following criteria: (a) the access routes must follow existing roads wherever possible, and (b) access routes must be placed so as to minimize road construction costs.

No site-specific impacts were associated with acquiring easements.

Timber Harvest Plan

The following section summarizes the ten-year timber harvest program for the south Bighorns (THP) (USDI, BLM 1982m).

Objectives

The document was prepared to assess the specific and cumulative impacts that might occur in the southern portion of the Big Horn Mountains from the BLM-initiated timber harvest activities. Past, present, and probable future timber harvests on adjacent private, state, and Forest Service lands were considered in the assessment of impacts.

Alternatives

Three alternative schedules were proposed for offering a total of about 6.7 MMBF of timber for sale, as described below:

Schedule 1

Alternative schedule 1 is as follows:

Fiscal year 1982, Rome Hill-Pass Creek (190 MBF)
FY 83, Mayoworth Slope (400 MBF), Woosley Cabin (300 MBF), and Upper North Fork (200 MBF)
FY 84, Baldwin Creek (500 MBF)
FY 85, Poison Creek (1,000 MBF)
FY 86, Red Springs Reservoir (200 MBF) and Upper North Fork (200 MBF)
FY 87, Lost Creek (250 MBF)
FY 88, Gardner Mountain (1,000 MBF)
FY 89, Arndt (500 MBF)
FY 90, No sale
FY 91, Horn (2,000 MBF)

Source Documents

Schedule 2

Alternative schedule 2 is as follows:

FY 82, Rome Hill-Pass Creek South (190 MBF)
FY 83, Mayoworth Slope (400 MBF), Woosley Cabin (300 MBF), and unidentified sale (200 MBF)
FY 84, Baldwin Creek (500 MBF)
FY 85, Poison Creek (1,000 MBF)
FY 86, Red Springs Reservoir (200 MBF)
FY 87, Gardner Mountain (1,000 MBF)
FY 88, Arndt (500 MBF)
FY 89, No sale
FY 90, Horn (2,000 MBF)
FY 91, Upper North Fork (2,000 MBF) and Lost Creek (250 MBF)

Schedule 3

Alternative schedule 3 is as follows:

FY 82, Rome Hill-Pass Creek South (190 MBF)
FY 83, Mayoworth Slope (400 MBF), Woosley Cabin (300 MBF), and Upper North Fork (200 MBF)
FY 84, Baldwin Creek (500 MBF)
FY 85, Poison Creek (1 MMBF)
FY 86, Horn (2 MMBF)
FY 87, Red Springs Reservoir (200 MBF)
FY 88, Arndt (500 MBF)
FY 89, Gardner Mountain (1 MMBF)
FY 90, Lost Creek (250 MBF)
FY 91, Upper North Fork (200 MBF)

Rationale

Timber sale schedule 3 was selected for four primary reasons: (a) the timber sale offerings would be consistent with BLM forest management policy, (b) the supply of timber would help contribute to the economic stability of local communities and industries, (c) no significant impacts were anticipated from implementation of this timber sale schedule, and (d) the proposed harvests would enhance deer and elk habitat in most cases.

Western Powder River Basin Coal

The following section summarizes the Western Powder River Basin MFP coal amendment (WPRB) (USDI, BLM 1981a).

Specific objectives for this amendment were to further process preference right lease applications by application of the unsuitability criteria, to identify lands to be considered further for possible lease exchange or modification, and to identify lands acceptable for future consideration for new competitive leasing. These activities required collecting and analyzing site-specific coal data.

No alternatives were considered in this amendment. At the time it was written, alternatives were not required for MFP amendments.

APPENDIX 6: LIVESTOCK GRAZING USE

IN THE BUFFALO RESOURCE AREA

APPENDIX 6
LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA

Number	Name	Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7001	Ahern, Mary B., John T.	C	1,622	2,609		38	09/01	- 02/28	60 C	162	10
7002	Allee, James et al	C	80	3,676		2	03/01	- 02/28	200 C	26	10
7003	Addison, Rodney R.	C	40	2,440		2	03/01	- 02/28	130 C	5	1
7004	McCurley, Doyle	C	80	1,881		4	03/01	- 02/28	6 C	10	10
7007	Arndt, Carl et al	I	2,720	2,811		49	03/01	- 02/28	160 C	274	1
									100 S		
7008	Arndt, Thelma et al	M	4,555	10,119	680	30	06/01	- 11/01	750 Y	452	10
									200 S		
7009	Arno, John W. et al	M	1,843	4,724	640	25			100 C	152	1
7011	Auzqui, Juanita	M	1,078	14,640	640	7	03/01	- 02/28	250 C	170	1
7015	Bales Ranch Inc.	C	80	680		10	03/01	- 02/28	700 C	11	10
7019	Bar 69 Cattle Co. Inc.	C	160	3,800		4	06/01	- 10/01	50 C	10	9
									11/15		
7020	Barbe, Dorie J.	C	120	960		11	03/01	- 02/28	130 C	13	10
7021	Barbour, Margaret L.	C	40	1,280		3	03/01	- 02/28	6 H	11	5
7022	Barlow	M	2,912	6,320	600	30	10/09	- 02/28	300 C	491	1
7023	Etchemendy Ranch	M	2,074	2,400		46	07/01	- 11/01	250 C	276	1
7024	Barton, Elmer	C	80	1,520		5	03/01	- 02/28	50 C	8	10
7028	Wagensen, Donald	M	4,306	5,353		44	03/01	- 06/01	350 C	419	1
									10/01		
7031	Belus Ranch Corp.	C	292	1,960	3,200	5	03/01	- 02/28	450 C	59	1
7036	Bergner Corporation	C	558	16,280	3,200		03/01	- 02/28	650 C	75	1
7037	Betz, Alvin C.	C	185	1,900		9	03/01	- 02/28	185 S	21	1
7038	Clark, Glen L.	C	1,247	12,860	640	8	05/01	- 10/30	80 C	131	8
7039	Bishop Land and Livestock	M	9,807	25,847	5,668	24	04/01	- 12/01	600 C	1,998	1
7040	Bittercreek Ranch	C	80	12,540	640	1	03/01	- 02/28	600 C	16	1
7041	Ostlund Investments	M	4,000	32,960	4,880	10	03/01	- 02/28	500 C	655	1
7044	Bloxom, Thelma	C	42	1,800		2	06/01	- 12/01	40 C	5	10
7045	Boardman, Gerald	C	40	1,040		4	03/01	- 02/28	200 C	11	10
7048	Boardman, Earl	C	1,617	2,640	320	4	03/01	- 02/28	160 C	236	9
7049	Boos, Angelo Trust	C	480	11,180	640	4	05/01	- 10/31	400 C	78	9
7050	Bow Arrow Ranch	C	2,656	14,117	1,280	1	03/01	- 02/28	450 C	306	1
7052	Staten, Ray A., Louisa	C	280	310		47	03/01	- 02/28	1 C	41	10
7054	Briles, Ben R.	M	1,778	1,280		58	03/01	- 05/30	60 C	178	2
									09/01		
7056	Brock Livestock Co.	M	5,047	18,042	840	21	05/01	- 12/15	450 C	603	1
7057	Brock Livestock Co.	C	240	18,042		1	03/01	- 02/28	100 C	20	1
									10 H		
7058	Brock, A. B. & Sons	I	9,236	6,427	1,600	53	03/01	- 08/01	1,000 S	917	10
									03/01		
7060	Brown, Donald L.	C	40	640		6	03/01	- 10/15	100 C		
7061	Brown Kennedy Ranch	M	2,122	23,640	1,600	8	03/01	- 02/28	130 S	8	10
7062	Franklin Brown et al	C	2,715	43,520	3,360	5	03/01	- 02/28	1,000 C	501	1
7066	Brug Land & Livestock Co.	M	680	6,920	640	8	03/01	- 02/28	500 C	462	1
7069	Bulkey, Clifford J.	C	400	720		36	09/01	- 12/31	487 C	128	1
7070	Bulkey, Terry & Janet	C	80	1,120		7	06/01	- 07/31	100 C	43	9
									06/01		

LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA
(continued)

Number	Name	Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7071	Bumbaca, James	C	360	3,160		10	05/01	- 10/31	100 C	43	9
7073	Burdick, Elizabeth C.	C	358	2,760	640	10	03/01	- 02/28	300 C	23	1
7074	Burgess, Henry & Mary	C	120	1,674		7	03/01	- 02/28	150 C	24	1
7076	Sun Oil Company	C	415	14,718	840	3	03/01	- 02/28	500 C	57	1
7077	Burkhardt, Arthur J.	C	38	1,800		2	03/01	- 02/28	85 C	13	10
7078	Burns Ranches, Inc.	C	360	6,960		5	06/01	- 09/30	200 C	23	10
7082	Butcher Ranch	C	640	3,280		2	03/01	- 02/28	600 C	119	1
7083	Butcher Ranch	C	240	1,520		14	03/01	- 02/28	500 C	61	1
7084	Cain Cobb	M	1,067	680		61	03/01	- 02/28	250 C	126	1
7085	Camblin	M	690	7,680		8	03/01	- 02/28	150 C	130	9
7086	Camino and Son	I	5,239	20,320	640	20	03/01	- 12/01	100 C	460	1
7087	Camino, Martin et al	M	241	1,360		15	06/01	- 09/15	2,000 S		
7090	Hanson Livestock Co.	M	3,886	4,964		44	05/01	- 01/15	1,100 S	35	1
7091	Carson, O. and R. J.	C	240	1,440		14	03/01	- 05/30	200 C	463	1
7091	Carson, O. and R. J.	C	240	1,440		14	08/01	- 12/28	110 C	37	9
7093	Carson, Dan	C	80	640		11	03/01	- 02/28	100 C	16	10
7094	Cash, Eugene D.	C	80	1,640		5	05/01	- 09/30	300 S	14	10
7095	Cash, Harold J.	C	460	1,060	400	24	04/15	- 07/15	125 C	48	9
7096	Cellars, Stewart	M	1,277	8,000	600	13	03/01	- 02/28	433 C	135	1
7097	Chabot, August et al	C	280	1,960		12	05/15	- 11/15	35 C	19	9
7098	Buffalo Creek Land Co.	C	4,892	18,160	640	21	03/01	- 02/28	600 C	592	1
7099	Christensen, Charles	M	4,028	7,240	160	35	03/01	- 02/28	300 C	413	1
7102	Christensen, John F.	I	11,300	11,260	1,920	46	03/01	- 02/28	140 C	1,701	1
7103	Christian, John et al	I	7,142	8,280	1,280	42	03/01	- 02/28	350 C	699	1
7105	Clabaugh ranch, Inc.	M	1,890	1,100	640	52	03/01	- 06/30	271 C	186	1
7106	Clabaugh	C	4,435	10,480		29	03/01	- 11/30	300 C	829	1
7108	Clark, Glen L.	C	40	1,960	2		03/01	- 02/28	20 C	10	1
7109	Clear Creek Grazing	M	908	840	52		03/01	- 02/28	200 C	92	9
7110	Collins, John & Joe	M	4,236	17,800	320	19	03/01	- 02/28	100 C	819	1
7112	Comer, John W.	C	40	640	200	5	03/01	- 02/28	25 C	7	1
7113	Ferry, Allen	M	1,225	3,160	640	24	03/01	- 02/28	350 S	118	1
7114	Cook, Ferris E.	C	40	2,200		2	05/01	- 10/31	50 C	6	9
7115	Cookaley	C	151	1,480	640	7	03/01	- 02/28	150 C	18	10
7116	Coones	C	40	4,320		1	03/01	- 02/28	200 C	4	10
7119	Curutchet, Jean	I	2,171	5,600	1,320	24	06/01	- 10/01	2,000 S	249	1
7120	Curutchet, Jean et al	C	478	3,160		13	03/01	- 05/30	2,000 S	43	1
7122	Wagenson, Donald W.	C	120	1,520		7	03/01	- 02/28	100 C	22	1
7123	Daly Livestock Co.	C	6,138	47,280		11	03/01	- 02/28	1,500 C	1,107	1
7129	Davis	M	2,109	4,650	640	29	04/01	- 08/31	105 Y	422	10
7130	Heike, Peter A.	I	3,240	515		86	09/16	- 12/15	150 C	470	1
7137	Wagoner	I	16,603	8,800		65	03/01	- 02/28	300 C	1,672	9
7141	Gammor Land & Livestock	C	37	185		17	03/01	- 02/28	400 C	9	1

LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA
(continued)

Number	Allotment Name	Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Number of Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7143	Dry Creek Ranch, Inc.	M	4,948	7,200	640	39	03/01	- 02/28	150 C	1,074	1
7144	Evans	C	71	3,183	960	2	04/01	- 05/10	200 C	25	10
7146	Durham Ranches, Inc.	C	280	16,880		2	03/01	- 12/14	700 F	56	10
7147	Eaton Brothers, Inc.	M	4,500	10,880	1,920	26	03/01	- 02/28	425 C	624	1
7148	Eklund, John C.	C	40	3,640		1	11/01	- 02/28	500 S	4	10
7149	Escor, Jean & Alberta	C	478	11,150	640	4	03/01	- 02/28	850 S	48	1
7150	Ellicott, Charles	C	114	2,595		4	03/01	- 02/28	35 C	24	10
7151	Elm, Leonard	M	1,360	720	520	52	03/01	- 03/31	80 C	93	10
7152	Elson Brothers	M	800	480		63	06/15	- 09/10	1,300 S	32	9
7153	Elson Brothers	M	1,760	920		66	06/15	- 09/10	1,500 S	13	9
7154	Smith, Lynn & Rod	C	427	5,526		7	04/01	- 12/31	100 C	93	1
7155	Engdahl	C	240	2,680		8	05/01	- 10/31	120 C	32	1
7156	Packard, Wayne & Muriel	C	160	640	320	14	06/01	- 10/01	250 C	16	10
7159	Esponda, Gladys	C	396	13,482	6,000	2	03/01	- 02/28	400 C	39	1
7160	Esponda, Gladys	C	760	19,440		4	03/01	- 05/30	4,500 S	84	1
7161	Edwards, Darrell	C	40	5,560		1	03/01	- 02/28	132 C	6	1
7162	Faddis, Kennedy Co.	M	5,566	14,612	640	27	03/01	- 02/28	900 C	593	1
7163	Fauber, George	C	120	120		50	06/15	- 09/01	30 C	7	10
7165	Fieldgrove, Cecil H.	C	432	1,910	1,920	10	03/01	- 02/28	300 C	46	1
7168	Fitch, W. B.	M	1,840	4,880		27	03/01	- 02/28	170 C	250	1
7169	Flint, Randall R.	M	1,679	5,147	720	22	03/01	- 02/28	200 C	384	1
7170	Floccihini, Armand SP	C	80	2,240		3	03/01	- 02/28	1,000 S	18	1
7171	Floyd Land & Livestock	M	7,673	15,120	960	34	05/15	- 11/01	500 C	915	1
7172	Floyd Land & Livestock	C	3,286	3,400	1,320	41	03/01	- 02/28	300 C	330	1
7173	Floyd Land & Livestock	C	340	2,560		12	06/01	- 10/01	225 C	34	1
7174	Forbes, Robert	C	766	271		74	03/01	- 02/28	40 C	83	1
7175	Rule, Dan	M	6,149	18,080	2,280	23	03/01	- 02/28	691 C	1,743	10
7176	Jackson, Burke L.	C	40	640		6	03/01	- 02/28	50 C	10	10
7177	Larrachas (Shippy)	C	280	6,720		4	05/01	- 10/31	691 C	48	1
7179	Foster, Ralph T.	C	920	4,288		18	03/01	- 02/28	150 C	160	1
7181	Ucross Land Co.	C	120	2,160		5	03/01	- 02/28	500 C	20	10
7184	Germann Land & Livestock	C	440	3,360		12	03/01	- 02/28	100 C	54	10
7186	Garrison, Michael et al	C	280	1,600	210	06/01	- 09/30	300 C	62	8	
7188	Garrison, E. L. Viola	M	1,226	1,535		44	03/01	- 02/28	300 C	210	1
7189	Watsonbaugh, Byron D.	C	120	3,920	80	3	03/01	- 02/28	200 C	24	1
7190	Aliemann, John F.	M	1,520	5,200		23	03/01	- 02/28	1,000 S	184	1
7191	Garrett, Patrick R.	C	762	7,520	640	9	05/01	- 07/30	135 C	88	9
7192	Gates, Fred	C	127	3,206		4	03/01	- 02/28	175 C	25	1
7193	Gates, Fred	C	40	120		25	03/01	- 02/28	65 C	4	1
7194	Garst	C	103	900		10	03/01	- 03/30	21 C	21	10
7195	Gibbs Brothers	C	95	8,040	160	1	06/01	- 01/30	350 C	12	9
7196	Gordon Crawford	M	8,983	10,644	1,640	42	03/01	- 10/15	620 C	1,068	10
7199	Gosney, Gary	C	160	560		22	03/01	- 02/28	100 C	27	10

LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA
(continued)

Allotment		Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
Number	Name		BLM	Private	State		From	To			
7202	Grams, Raymond	C	40	960		4	03/01	- 02/28	25 C	7	10
7203	Craves, Norris R.	I	9,173	5,045	640	62	06/01	- 11/30	1,150 S	553	1
7205	Johnston, Howard & Miller	C	360	1,360		21	05/15	- 12/31	70 Y	24	10
7207	Cuess, Roy H., Ruth F.	M	1,280	2,020		39	07/01	- 10/01	35 C	64	10
7208	Gustafson, William H.	C	80	1,480		5	03/01	- 02/28	50 C	20	10
7213	Hall, Dean W.	C	200	6,640		3	03/01	- 02/28	230 C	44	1
7216	Hamm, Don Robert	C	362	4,320		8	03/01	- 02/28	300 C	77	9
7217	Hamm, Hugh R.	C	80	2,880		3	05/25	- 09/04	90 C	12	10
7218	Hammond, William D.	C	200	3,900	1,080	4	03/01	- 02/28	200 C	20	10
7219	Circle W	C	320	560	800	19	03/01	- 02/28	5 C	39	10
7221	Sussex Oil Company	M	920		440	67	06/01	- 10/15	10 C	46	1
7222	Harlan, James S.	C	441	3,860	80	10	06/22	- 10/22	1,500 S	24	1
									120 C		
7223	Harlan, Charles & Robert	C	1,200	3,922	640	21	06/25	- 10/01	2,300 S	75	3
							07/04	- 08/14	300 C		
7224	Harper, George & Mary	C	120	320	360	15	06/01	- 10/31	100 C	30	8
7225	Harriet Brothers	C	320	2,038		14	06/20	- 09/15	4,500 S	211	1
7226	Harriet Brothers	I	38,792	32,840	3,920	53	03/01	- 06/01		4,582	1
							and		9,000 S		
							10/01	- 02/28			
							03/01	- 02/28	600 C		
7227	Harriet Brothers	I	14,759	23,160	3,840	35	03/01	- 02/28	500 S	1,082	1
								100 C		204	3
7228	Harriet, Simon H.	C	1,861	8,360	640	17	03/01	- 06/10			
							12/01	- 02/28			
7229	Harriet Bros., A Part.	C	80	1,280		6	06/01	- 10/01	1,000 S	8	1
7231	Harris Ranch	C	40	2,400		2	03/01	- 02/28	60 C	8	2
7232	Ray, Frank & Floyd	C	279	9,320	1,160	3	03/01	- 04/01	21 C	83	1
							12/01	- 02/28			
7233	Harrold, Glenn	M	2,086	4,227		33	03/01	- 02/28	200 C	389	1
7234	Tarver Trust	C	689	2,755	1,280	14	04/01	- 01/01	75 C	128	1
7235	Powder River Cattle	I	9,346	22,034	2,560	28	03/01	- 02/28	600 S	977	1
							03/01	- 12/15	650 C		
7236	Delapp, Neil & Norma	I	6,573	7,320	1,100	44	04/01	- 10/01	1,220 Y	493	10
7238	Kaycee Land & Livestock	C	721	3,800	120	16	05/01	- 10/31	304 C	40	10
7240	Hayden, Darrell	C	117	920		11	06/15	- 11/15	100 C	18	2
							11/01	- 02/28	600 S		
7241	Hayden, Darrell	I	1,776	2,440	640	37	03/01	- 06/20	250 C	206	3
							10/09	- 02/28			
7242	Hayden, Doyle	M	19,376	12,054	1,840	58	03/01	- 02/28	400 C	2,235	1
7243	Hepp, Fred	M	1,640	2,897		36	05/01	- 11/25	150 C	164	10
7244	Hepp, Charles	M	2,493	7,367	320	24	03/01	- 02/28	200 C	249	1
7245	Hampshire	M	1,144	2,112		35	05/15	- 09/15	150 C	129	4
							09/16	- 12/31			
7246	Hepp, Ralph	C	630	6,320	680	8	05/01	- 10/28	383 C	68	10

LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA
(continued)

Number	Name	Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7247	Hepp, Ralph	M	2,664	4,080	320	38	03/01	- 04/29	290 C	270	10
7248	Hepp, Ralph & Robert	I	8,098	3,478	160	65	09/01	- 02/28	290 C	471	4
7249	Heptner, Darrell L.	C	117	2,440	320	4	05/01	- 06/31	100 C	28	8
7250	Hesse, Fred	C	678	15,364	640	4	03/01	- 02/28	200 C	58	1
7253	Hollcroft, Leo et al	M	1,207	2,817		30	03/01	- 03/31	200 C	121	9
7254	Holler, D. C. & Jene	C	4,675	15,240	1,120	22	03/01	- 02/28	629 C	420	1
7259	Hope, Joe E.	M	3,178	1,643	720	57	05/01	- 08/31	100 C	457	1
7260	Rene Livestock Corp.	C	117	8,913		1	03/01	- 02/28	400 C	17	10
7262	Odegard, Duane D.	M	1,335	2,735	720	28	03/01	- 02/28	300 C	140	10
7266	Reculusa and Graves	C	1,400	22,818		6	03/01	- 02/28	150 C	88	1
7267	Sloan	C	240	2,474	680	7	04/07	- 12/11	250 Y	49	10
7268	Ullery	I	1,478	600		60	04/15	- 06/14	141 C	129	10
7270	Iriberry Brothers	C	120	960	640	7	06/01	- 10/01	3,000 S	14	1
7271	Brubaker	I	15,279	15,620	1,920	47	03/01	- 02/28	150 C	1,676	1
							and	06/15	1,500 S		
7276	Jarrard, Harold	C	40	3,440		1	10/01	- 02/28			
7277	Jarrard, Harold	C	40	640		6	03/01	- 02/28	1,600 S	4	10
7278	Jeffeera, Deyo & Vieva	C	40	2,080		2	06/01	- 09/30	175 C	7	10
7280	Jenkins, Terry F.	M	3,869	15,357		20	03/01	- 02/28	500 C	512	1
7282	Russell K. Green	C	160	960		14	05/15	- 11/30	50 C	29	6
7283	Jones, Paul V.	M	2,084	15,216	1,280	11	03/01	- 02/28	150 C	210	9
									2,000 S		
7285	Jones, Thomas I.	I	8,932	8,039	1,280	49	03/01	- 02/28	120 C	901	1
7286	Kauffman, Gerald M.	M	5,208	16,520	1,080	23	03/01	- 02/28	800 C	610	1
7289	Kendrick Cattle Co.	M	8,319	50,000		14	03/01	- 02/28	800 C	1,231	1
7290	Kenderson, Ken	M	1,944	9,502		17	03/01	- 02/28	200 C	211	1
7291	Knudson, Eddie (see 7290)										
7293	Hoblit	C	140	1,865		7	05/01	- 11/23	68 C	23	10
7295	Kluttz, Fred	M	2,471	9,600	640	19	03/01	- 02/28	230 C	568	1
7297	Koch	C	320	7,806		4	04/01	- 04/30	30 C	35	10
7299	Kretschman	C	640	1,280		33	03/01	- 02/28	55 C	73	1
7300	Kretschman, Gene	M	1,028	2,240		31	04/01	- 12/01	140 C	174	1
7301	Schiermester	C	800	14,440	680	5	04/01	- 06/21	550 C	114	1
								10/20	- 01/22		
7303	Cow Creek Ranch, Inc.	M	2,678	5,669	640	30	03/01	- 02/28	76 C	251	1
7304	Laramore, Robert	M	6,163	3,329	960	59	03/01	- 02/28	80 C	808	1

LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA
(continued)

Number	Allotment Name	Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7308	Lawrence Land Co., Inc.	C	165	7,800	1,320	2	03/01	- 02/28	500 S	19	10
7309	Lawrence, Charles	M	560	1,600	40	25	07/01	- 09/01	58 C	59	10
7310	Lawrence, Charles	M	2,838	11,300	1,400	18	10/15	- 02/28	800 S	285	10
7312	Hoyt, Floyd Jr.	M	3,837	6,960		36	03/01	- 02/28	2,000 S	612	1
7313	Leath, Robert	C	1,000	2,400	640	36	06/01	- 02/01	90 C	123	1
7314	Alliemand, John & Penn	M	3,601	3,425		51	03/01	- 02/28	50 C	380	1
7315	Legeroski Ranch	C	359	280		56	05/01	- 09/30	125 C	72	9
7318	Leiter, Marian M.	M	1,315	1,072		55	06/01	- 09/30	1,100 S	175	9
7319	Lester, Mayne	C	80	3,680		2	03/01	- 02/28	100 C	8	1
7320	Linch Family Trust	C	80	3,240	240	2	03/01	- 02/28	2 H	15	1
7323	Little Bighorn Ranch	C	40	200		17	05/15	- 09/30	10 H	8	9
7324	Little Ranch	C	852	5,656	640	12	03/01	- 06/30	1,400 S	86	9
							10/01	- 02/28			
7327	Taylor, Raymond S.	C	156	1,441		9	06/15	- 09/30	50 C	26	10
7329	Lohse, Glen	C	1,000	640		60	03/01	- 02/28	15 C	92	1
7331	Watsbaugh, Byron B.	C	100	880	680	9	03/01	- 02/28	280 C	32	1
7332	Miller, Elgin	C	765	4,160		15	04/01	- 11/30	100 C	72	9
7333	Lyman, Clair	C	640	1,720		37	03/01	- 02/28	4 C	47	1
7336	Mallie, Lloyd & Carol	C	69	880		7	03/01	- 02/28	250 S	9	10
7338	Mallie, Lloyd & Carol	C	313	4,120	640	6	05/01	- 09/30	140 C	49	9
7339	Mankin, J. Richard	M	1,920	2,480	640	4	03/01	- 02/28	100 C	262	1
7340	Mankin, Bill	C	680	8,280	1,000	7	03/01	- 02/28	220 C	113	1
7342	Anderson	C	480	15,400		3	09/02	- 02/28	50 C	107	1
7344	Lynde	C	241	11,520	640	2	03/01	- 02/28	350 C	45	1
7345	Marquiss, Opal E.	C	1,482	9,100	680	13	03/01	- 02/28	200 C	306	1
7347	Marton Brothers, Inc.	C	433	1,198		26	06/20	- 09/01	800 S	21	2
7348	Marton Brothers, Inc.	I	19,186	29,949		39	03/01	- 06/19	4,900 S	1,825	1
							10/01	- 02/28			
7349	Marton Brothers, Inc.	M	5,294	2,360		69	06/20	- 09/20	1,400 S	571	1
7350	Maycock, Joe N.	C	840	9,920	640	7	03/01	- 05/30	650 C	96	10
							11/01	- 02/28			
7351	Master Land & Livestock	C	515	3,982	640	10	03/01	- 02/28	500 C	57	1
7352	Maycock, Michael A.	C	80	4,200	640	2	03/01	- 05/30	650 C	8	10
							11/01	- 02/28			
7353	Maycock, Mitchel M.	C	320	20,120	640	2	06/01	- 10/31	650 C	47	10
7354	Maycock, William F.	C	399	6,630		6	06/01	- 10/31	650 C	40	10
7355	McClue, James A.	C	1,278	4,188	320	22	05/15	- 01/30	130 C	163	1
7356	Maycock, Wm. F. II	C	639	3,920		14	03/01	- 05/30	650 C	64	10
							11/01	- 02/28			
7359	Odekooken, Leon	M	1,493	2,145		41	05/01	- 10/01	115 C	284	10
7360	McLaughlin, Galen	C	80	2,025	320	3	06/01	- 11/30	80 C	18	9
7361	Meike, Don & Pete	C	200	1,640	840	7	06/01	- 06/15	1,000 S	48	1
							09/16	- 10/30	150 C		
7362	Meike, Peter & Sons	M	5,683	21,039		21	04/01	- 12/31	3,500 S	550	1
								773 C			

LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA
(continued)

Number	Name	Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7363	Mercer, Tom	M	494	1,840		21	06/15	- 10/01	200 C	63	1
7364	Michelena	M	3,405	4,459	640	40	03/01	- 07/03	1,800 S	348	1
7365	Miller, Grayce E.	C	1,832	26,993	640	6	06/20	- 07/01	1,200 S	202	10
	Miller Cattle Co.	C	40	1,562	960	2	05/01	- 12/31	160 C	7	9
7367	Roberts & Vineyard	C	200	8,120		2	05/01	- 02/28	250 C	50	10
7368	Mills, Clarke K.	C	40	8,520		1	03/01	- 02/28	80 C	8	10
7373	Mooney, Gordon	C	440	4,330		9	03/01	- 02/28	110 C	52	1
7374	Mooney, Donald B.	C	80	4,330		2	03/01	- 02/28	120 C	13	1
7375	Moore Land Company, Inc.	C	680	3,840	800	13	03/01	- 02/28	350 C	216	1
7380	Moore, James R.	C	3,291	28,240	800	10	03/01	- 02/28	608 C	566	1
7381	Ninenihi Land Co.	C	80	18,870		1	03/01	- 02/28	400 C	12	1
7382	Morse Ranch, Inc.	M	3,511	19,026	1,440	15	03/01	- 02/28	1,200 S	771	1
7389	Niedringhaus, Lambert	C	440	840		34	05/01	- 05/31	10 C	24	9
						07/10	- 11/15				
7392	Norfolk, Ed	M	1,840	10,960	840	13	03/01	- 02/28	1,200 S	299	1
7393	Norfolk, Aleene A.	M	1,110	11,840	2,480	7	03/01	- 02/28	20 C	231	1
7394	Norfolk, Aleene	M	3,302	15,120	1,920	16	03/01	- 02/28	550 C	713	1
7396	Norman Ranch Co.	C	320	6,640	1,320	4	03/01	- 02/28	230 C	84	1
7397	Norman Ranch Co.	C	302	3,440		8	03/01	- 02/28	230 C	50	1
7399	Simpson, John & Hilda	C	40	10,920	1,800	1	03/01	- 02/28	900 C	7	1
7401	Lester, Theta H.	C	954	3,966	640	17	03/01	- 02/28	200 C	148	1
7402	Oudekoven, Elmer	C	178	2,280		7	03/01	- 02/28	170 C	21	1
7404	Oliver, Claude L.	C	200	5,560		3	03/01	- 02/28	142 C	52	1
7405	Olsen, Flora	C	121	3,720		3	03/01	- 02/28	36 C	18	1
7410	Osborn	C	280	4,460		6	03/01	- 02/28	27 C	39	5
7411	Ostlund Investments	C	640	1,000		39	03/01	- 02/28	100 C	160	1
7412	Packard, Gary & Susan	C	235	3,744		6	06/01	- 10/24	250 C	24	10
7413	Parks	M	1,927	2,842	220	39	05/01	- 12/08	200 C	364	2
7414	Park	C	759	4,042	640	14	04/01	- 12/24	150 Y	127	2
7415	Parnell, Reginald	C	76	1,344		5	03/01	- 02/28	125 C	19	1
7422	Pileh	C	311	800	640	18	05/01	- 11/01	100 C	65	8
7423	Persson, Clarence	C	200	7,674	1,280	2	03/01	- 02/28	250 C	48	1
7424	Peters Grazing Association	C	597	20,540	2,240	3	03/01	- 02/28	2,400 C	113	1
7427	Pickrel Land Cattle	M	2,366	14,000		14	03/01	- 02/28	1,600 C	356	1
7428	Pickrel Land Cattle	C	120	6,330	640	2	03/01	- 02/28	1,600 C	32	1
7435	Powder River Ranch	I	17,072	14,271	640	53	03/01	- 02/28	454 C	1,779	1
7436	Pownall, Jack	C	80	5,235	640	1	06/01	- 11/15	120 C	13	9
7439	Purdy, Robert et al	C	160	8,222	6,688	1	03/01	- 02/28	1,000 C	33	1
7446	Rahourn, Melbern	C	40	960		4	03/01	- 02/28	44 C	8	1
7447	Rafter L Ranch	M	5,763	8,000	1,440	37	03/01	- 02/28	80 C	789	10
									1,100 S		
7448	Carr, Richard	C	400	240		62	03/01	- 02/28	15 C	43	1
7449	Ramsbottom, Wallace	M	7,189	6,520	1,880	46	06/01	- 10/20	700 C	430	1

Livestock Grazing Use

LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA (continued)

Number	Name	Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7454	Cundy	C	160	1,200		12	03/01	- 02/28	75 C	41	1
7455	Reculusa, Marie	C	598	10,441	640	5	03/01	- 07/15	2,000 S	68	10
7456	Reculusa, Marie	C	160	980		14	07/04	- 09/15	400 S	42	10
7457	Reece, Richard W.	C	263	2,480		10	03/01	- 02/28	90 C	30	9
7458	Reece, Ernest	M	2,715	5,074		35	03/01	- 02/28	200 C	414	1
7459	Tweedy, Joanne & Chas	C		74	660	10	09/01	- 12/31	350 S	11	1
									33 C		
7460	Love Land & Cattle	C	920	8,290		10	03/01	- 02/28	400 C	205	1
7469	Ritchie, William W.	C	83	640		11	11/16	- 02/28	175 C	8	1
7470	Ritchie, William W.	M	2,676	3,173	1,000	39	04/01	- 11/15	175 C	290	1
7472	Roberts, Donald H.	C	979	37,461	1,640	2	03/01	- 10/05	1,200 C	124	10
7476	Ross, Jack & Pearl	C	79	62		56	07/15	- 09/15	4 C	9	10
7478	Rourke & Offutt	C	477	2,200	640	14	03/01	- 02/28	90 C	125	1
7479	Rourke, Paul D.	C	40	1,720		2	03/01	- 02/28	112 C	10	1
7480	Ruby Ranch, Inc.	C	639	280		70	03/01	- 02/28	80 C	67	1
7481	Same Ranch, Inc.	C	730	8,398		8	03/01	- 02/28	400 C	155	1
7482	TTT	M	12,727	48,032	3,480	21	03/01	- 02/28	800 S	1,378	10
									500 C		
7483	Schiermester, Milton	C	80	600	80	10	03/01	- 02/28	120 S	16	1
7485	V Bar F	M	4,610	4,964		48	04/10	- 07/10	240 C	461	1
									300 C		
7486	V Bar F Cattle Co.	C	37	960		4	07/10	- 11/30	300 C	7	1
7489	Scott, Marion	C	2,833	11,927	1,960	17	06/01	- 10/30	650 C	534	1
7490	Paddock Ranch Co.	C	440	2,560	1,200	10	05/01	- 06/07	1,300 C	88	9
									267 C		
7498	Belus	C	120	1,160	80	9	05/15	- 08/09	130 Y	30	1
7499	Seven Up Ranches, Inc.	C	2,253	24,627	1,920	8	03/01	- 02/28	500 C	237	10
7501	Sharp, S. Edward	C	40	1,320		3	03/01	- 02/28	53 C	7	1
7502	Skidmore Estate	C	26	3,000		1	06/01	- 09/01	50 S	9	1
7503	Simpson, John H.	C	1,078	10,920	1,800	8	03/01	- 02/28	60 C	191	1
7504	Skiles, David F.	C	156	4,880		3	03/01	- 02/28	800 C	15	1
7505	Soldier Ranch	C	1,143	3,551		29	03/01	- 02/28	250 C	229	1
7508	Smith, Alfred L.	C	242	6,560	2,560	3	05/01	- 10/31	67 C	28	10
7509	Smith, Alfred L.	C	242	6,792		3	05/01	- 10/31	62 C	26	10
7510	Smith, Alfred Robert	C	1,437	21,755	640	6	05/01	- 10/31	109 C	84	1
7511	Smith, Dean H.	C	2,266	3,706		38	03/01	- 02/28	200 C	289	1
7512	Rowley	M	3,139	3,064	640	46	03/01	- 02/28	200 C	309	3
7513	Smith	C	120	733		14	03/15	- 11/15	10 H	23	1
									10 C		
7517	Smith, Clifford L.	C	2,320	7,560	640	21	03/01	- 02/28	300 C	385	1
7518	Snider, Gene R. et al	C	40	3,760	640	1	03/01	- 06/30	100 C	6	9
7519	Sorenson, Glenn	C		320	5,560	5	09/01	- 12/31	100 C	32	9
7520	Sorenson, Robert C.	M		1,859	2,840	40	03/01	- 02/28	175 C	315	1

LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA
(continued)

Number	Name	Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7521	Spellman, Howard	C	1,440	2,880		33	03/01	- 02/28	200 C	236	1
7522	Elmore, Mike	C	80	6,066		1	03/01	- 02/28	200 C	26	1
7523	States, J. Vernon	C	169	3,080		5	03/01	- 02/28	400 C	34	9
7525	Stephenson, Gladys W.	C	80	3,000		3	07/01	- 11/30	70 C	20	9
7528	Mary Straatma Estate	C	40	2,240		2	03/01	- 02/28	350 C	6	1
7529	Streeter, John	I	6,080	16,420	1,280	26	03/01	- 02/28	290 C	823	1
									1,000 S		
7530	Ratcliff	M	1,017	800		56	04/01	- 11/01	215 C	102	8
7531	Stuart Ranch Partnership	C	80	12,500		1	03/01	- 02/28	500 C	16	1
7532	Suel Ann Trustee	C	200	360	1,793	8	09/01	- 11/30	140 C	40	9
7534	Svalina, Frank	C	40	2,720		1	03/01	- 02/28	400 C	6	1
7535	Svalina, Margaret	C	40	3,720		1	03/01	- 02/28	150 C	6	1
7537	Swarts, Edward H.	M	2,480	11,461	923	17	03/01	- 02/28	325 C	621	1
7539	Symons, Edgar W.	C	160	800	240	13	10/01	- 02/28	100 C	28	9
7540	T R Ranch, Inc.	M	11,746	32,407	4,360	24	03/01	- 02/28	100 C	1,400	1
7542	Edwards, Ronald D.	C	40	2,270		2	03/01	- 02/28	325 C	8	1
7543	Tanner, Howard	C	39	6,680	1,440	1	03/01	- 02/28	175 C	6	1
7544	Hunter Ranch	C	2,075	14,800	1,480	13	03/01	- 02/28	366 C	367	9
7546	Taylor Brothers Livestock	C	40	850		4	03/01	- 02/28	500 C	13	1
7547	Taylor Brothers Livestock	C	83	1,097	40	7	03/01	- 02/28	500 C	20	1
7548	Taylor, Effie M.	C	40	1,320	480	2	03/01	- 04/03	40 C	10	10
							12/01	- 02/28			
7549	Taylor Ranch Co., Ltd.	C	1,521	3,680	40	29	03/01	- 02/28	760 C	179	1
7550	Gary Tarver Trust	C	440	1,000		31	03/01	- 02/28	125 C	58	10
7552	Horseshoe Estates	C	880	3,080	120	22	06/01	- 09/30	200 C	24	9
7553	Texaco, Inc.	C	120	600		17	05/01	- 09/30	250 C	24	9
7554	Thar, Francis J.	C	1,157	14,623	1,793	7	03/01	- 02/28	100 C	285	10
7556	Thar, Francis J.	C	40	2,240	640	1	03/01	- 02/28	750 C	6	3
7558	Thar, Vincent	C	40	3,380	640	1	03/01	- 02/28	250 C	6	1
7559	Double E Ranch	C	80	2,920		3	03/01	- 02/28	150 C	11	1
7560	Thom Brothers	C	31	4,969	200	1	06/01	- 09/30	300 C	4	10
7561	Thompson, John I.	C	120	1,240		1	03/01	- 02/28	200 C	20	1
7562	Gordon Creek	I	2,118	1,280		62	06/25	- 09/10	500 C	285	10
7564	Gates-Yonkee	C	560	3,120	640	11	06/01	- 09/30	90 C	86	10
7565	Throne, John & Earl	C	120	6,720		2	03/01	- 02/28	66 C	24	10
7566	Tibbets, Coyne C.	C	122	6,035		2	04/01	- 07/31	150 C	16	9
							11/01	- 11/31			
7569	Trail Creek Grazing Assoc.	M	7,244	23,886	2,240	22	03/01	- 02/28	1,250 C	2,624	1
7570	N. Leiter	C	117	514		19	12/01	- 02/28	80 C	40	5
7576	Urrutty, Martin	C	1,726	10,317	647	10	03/01	- 02/28	150 C	262	1
7577	Urrutty, Vivian	C	80	980	80	7	03/01	- 02/28	100 C	20	1
7578	Vannoy, Wallace	C	1,988	18,720	640	9	03/01	- 02/28	400 C	236	1
7579	Dry Vee	M	4,442	2,160		67	06/17	- 09/01	600 S	911	1
							11/01	- 02/27	1,500 S		
7580	Meikler, Peter & Donald	C	360	720		33	11/10	- 01/15	100 C	26	1
							11/16	- 01/15	250 S		

LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA
(continued)

Number	Name	Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7581	Koch Ranch	I	3,157	13,680	640	18	08/30	- 12/01	110 Y	272	1
7582	Voiles, Joy	C	200	1,240		14	12/02	- 02/01	1,000 S		
7585	Wagensen, Donald	M	3,059	17,660	960	15	06/01	- 12/01	100 C	20	1
7586	Wagensen, Don et al	C	441	9,000	1,280	4	06/01	- 09/15	350 C	498	1
									550 S	90	1
									170 C		
7588	Wagonhammer Land Lsk.	C	534	9,250	600	5	03/01	- 02/28	150 C	92	1
7590	Wallace, Thomas P.	C	200	4,320		8	03/01	- 02/28	125 C	33	1
7591	Wallis, Earl	C	161	1,153		12	03/01	- 02/28	45 C	27	1
7594	Carlock, Pauline	C	306	2,328		2	03/01	- 02/28	150 C	32	1
7596	Watt, Donald J.	C	40	3,140		1	06/01	- 11/30	133 C	8	10
7597	Watt Ranch	M	1,664	3,160	640	30	04/15	- 02/15	240 C	202	1
7599	Watt, Earle	C	46	520		8	03/01	- 02/28	10 C	6	1
7601	West, Florence A.	C	1,122	10,320		10	03/01	- 02/28	50 C	153	1
7604	Thrush Land & Cattle	M	3,711	5,920		39	04/15	- 10/30	1,000 S	750	2
7605	Low Murphy & N. Fork	C	1,810	2,663		40	03/01	- 02/28	100 C	211	1
7606	West, W. F. & M. E.	C	480	960		33	03/01	- 02/28	200 C	48	1
7607	Will, Frank D. et al	C	78	1,280		6	03/01	- 02/28	117 C	14	10
7609	Williams, Clyde O.	C	283	1,200		19	12/01	- 01/01	50 C	40	10
7611	Williams, John et al	C	557	1,120		33	03/01	- 02/28	235 C	96	1
7612	Williams, Laura E.	C	40	1,730		2	04/01	- 12/31	75 C	10	9
7616	Wolcott, Wayne E.	M	2,115	2,480		46	03/01	- 02/28	60 C	128	1
7618	Wolfe, John E. Mrs.	C	40	1,600		2	03/01	- 02/28	32 C	6	1
7623	Meadowlark Farms, Inc.	C	480	19,342	1,920	2	03/01	- 02/28	250 C	82	10
7624	Wright Ranch Co.	C	1,282	3,520	1,849	19	03/01	- 02/28	361 C	132	1
7625	Wuthier, L. A.	C	80	1,385	40	5	05/15	- 10/30	78 Y	13	10
7627	Y Bar U Ranch Co.	M	6,874	23,680	2,640	20	03/01	- 02/28	215 C	970	1
							05/01	- 12/01	1,500 S		
7628	Culver	I	4,419	3,100	1,600	48	04/01	- 03/30	171 C	1,003	1
7629	Zezas Ranch, Inc.	C	156	18,820	1,120	1	03/01	- 03/30	366 C	39	10
7630	J & F Corp.	I	8,390	2,920	1,546	65	06/01	- 09/30	171 C	778	1
7635	Snyder, William A.	C	41		1,920	2	03/01	- 02/28	290 C	12	1
7636	Wyoming Pingsauer	C	200	760		21	03/01	- 02/28	350 C	36	1
7637	Young, James M.	C	120	680		15	03/01	- 02/28	200 C	11	1
7641	NX Bar Ranch, Inc.	C	40	1,255		3	03/01	- 07/31	50 C	8	1
							11/01	- 02/28			
7642	Myers, Cecil	C	200	640		24	03/01	- 03/30	73 C	33	9
7645	Fourmile Ranch	I	7,845	9,860	3,200	38	03/01	- 02/28	2,000 S	658	1
7646	Worwood Ranch	I	7,537	18,910	1,920	27	03/01	- 02/28	2,000 S	914	1
7649	Wagensen, Don et al	C	80	9,000	1,280	1	06/01	- 12/30	100 C	20	1
7650	Wagner, Roger	C	40	760		15	10/01	- 01/31	70 C	6	10

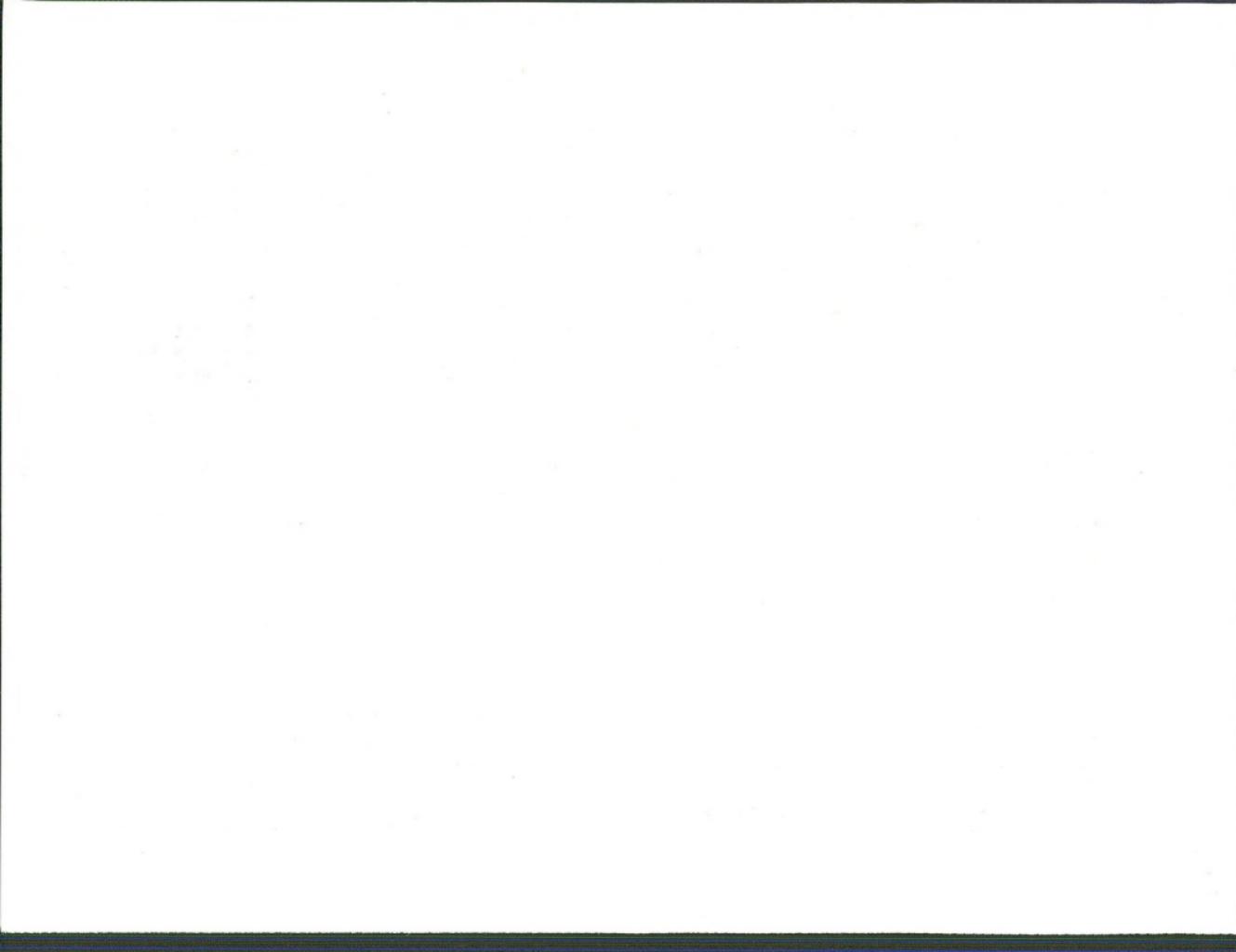
LIVESTOCK GRAZING USE IN THE BUFFALO RESOURCE AREA
(continued)

Livestock Grazing Use

Number	Name	Management Category	Land Status Acreage			Percentage of Federal Acreage	Period of Use		Number and Kind of Livestock	Federal AUMs	Term of Lease (years)
			BLM	Private	State		From	To			
7652	Koch	C	200	10,582		2	03/01	- 02/28	120 C	40	10
7653	Chabot, August et al	C	147	586		20	10/20	- 11/15	1,000 S	120 C	14
7654	Reno	C	160	5,042	640	3	07/01	- 11/01	400 C	16	1
7655	Reculusa, Joseph	C	40	4,069		1	03/01	- 02/28	750 S	4	1
7656	Sorenson, Robert L.	C	80	3,432		2	03/01	- 02/28	20 C	20	1
7657	Anderson	C	1,319	4,740	640	68	03/01	- 02/28	200 C	328	1
7658	Domingo Marterina	M	4,890	5,580	640	44	04/01	- 07/01	300 Y	380	10
							04/15	- 10/31	600 S		
7659	Dickinson, Gerald	C	832	2,456		25	06/01	- 09/15	60 C	159	10
7660	Blue Creek Ranch	I	11,541	17,500	5,000	34	03/01	- 02/28	950 C	1,844	1
7661	Curuchet, Santiago	M	1,282	5,661		18	03/01	- 02/28	50 C	147	1
7662	Firnekas, Charles	I	9,000	5,400	1,760	56	03/01	- 02/28	125 C	738	1
									1,000 S		
7663	Firnekas, Chester	C	200	360	640	17	03/01	- 02/28	100 S	20	1
7664	Gosney, Elmer	C	318	5,817	80	5	03/01	- 02/28	350 C	63	1
									1,400 S		
7665	Graves, Dean	C	720	2,852		20	06/01	- 09/27	150 C	94	10
7666	Graves, Wayne	C	788	1,080		42	11/01	- 01/30	150 C	81	10
7667	Moffett, William	M	1,120	4,000		22	05/01	- 12/31	180 C	132	1
7669	Johnson, Mitchell	M	2,754	3,960		41	03/01	- 02/28	1,200 S	340	1
									75 C		
7670	Johnson, Mitchell	M	639	760		46	05/01	- 11/30	75 C	65	1
7671	Lund, Fred	M	2,268	4,060	160	33	03/01	- 02/28	200 C	232	10
7672	Meike, Peter & Sons	C	501		200	71	06/16	- 07/30	600 S	134	1
7674	Taylor, Laura E.	C	493	1,240	640	21	03/01	- 02/28	70 C	69	1
7675	Taylor, Wm. H.	C	798	5,800	680	11	06/01	- 10/28	100 C	79	10
7678	Harlan, James	M	2,736	5,223		26	03/01	- 02/28	150 C	335	1
7679	Mayer, Vern P.	C	98	640		13	09/30	- 02/28	20 C	12	10
7681	McPhee, H. McDonald	C	40	240		14	04/15	- 09/14	200 S	10	10
7682	Moriarty, Jack L.	C	40	25		61	07/01	- 09/30	4 S	8	9
									2 C		
7685	R C Ranch	C	280	1,800	640	10	03/01	- 02/28	300 C	32	9
7999	Neyworth Stock Trail		13,957			100	variable		C & S	1,977	NA

ABBREVIATIONS: H = horse; C = cattle; Y = yearling cattle; and S = sheep.

NOTE: The number of grazing leases in the resource area fluctuate from 400 to 420 leases. This is due to things such as lease consolidations, ranch unit breakups, or transfer of administration of leases between resource areas. Changes may be initiated by either the BLM or the lessee. This list is complete as of February 1984.



APPENDIX 7: WILDERNESS MANAGEMENT AND WILDERNESS STUDY AREAS

STUDY AND DRAFT EIS—BUFFALO RESOURCE AREA WILDERNESS STUDY AREAS

Purpose and Need

Purpose

The purpose of this study is to evaluate the suitability for wilderness designation of three areas in the Bureau of Land Management's Buffalo Resource Area. Suitability will be determined in accordance with the guidelines in the Wilderness Act of 1964. The three wilderness study areas (WSAs) under consideration are Gardner Mountain (6,423 acres), North Fork of the Powder River (10,089 acres), and Fortification Creek (12,419 acres)—a total of 28,931 acres (see the Surface Ownership map for each WSA).

Review

The need for this study and environmental impact statement (EIS) results from section 603 of the Federal Land Policy and Management Act of 1976 (FLPMA), which directs the BLM to review all public land for its wilderness potential. The review process developed by the BLM has three phases: inventory, study, and reporting.

Inventory

The inventory phase identified areas with wilderness characteristics, as defined in the Wilderness Act of 1964, and designated them as WSAs. Guidelines for conducting the inventory phase were set forth primarily in the BLM's "Wilderness Inventory Handbook" of 1978.

Areas under consideration as wilderness are evaluated for the features described below.

Wilderness Values

The following key factors are considered in identifying roadless areas with wilderness characteristics:

Size: The area must have at least 5,000 contiguous roadless acres of public land.

Naturalness: Human imprints must be substantially unnoticeable.

Outstanding Opportunities: The area must offer either an outstanding opportunity for solitude or an outstanding opportunity for primitive and unconfined recreation.

The BLM also considered the extent to which each of the following wilderness values is present:

Special Features: Ecological, geological, or other features of scientific, educational, scenic, or historical value.

Multiple Resource Benefits: The benefits to other multiple resource values and uses that only wilderness designation could ensure.

Diversity in the NWPS

Also to be considered are the following elements of diversity in the National Wilderness Preservation System (NWPS).

Ecosystem and Landforms: Whether natural systems and features, as represented by ecosystems and landforms, are represented elsewhere in the region or in the NWPS.

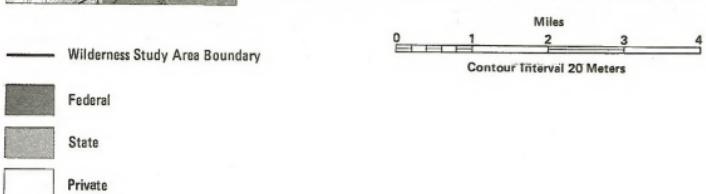
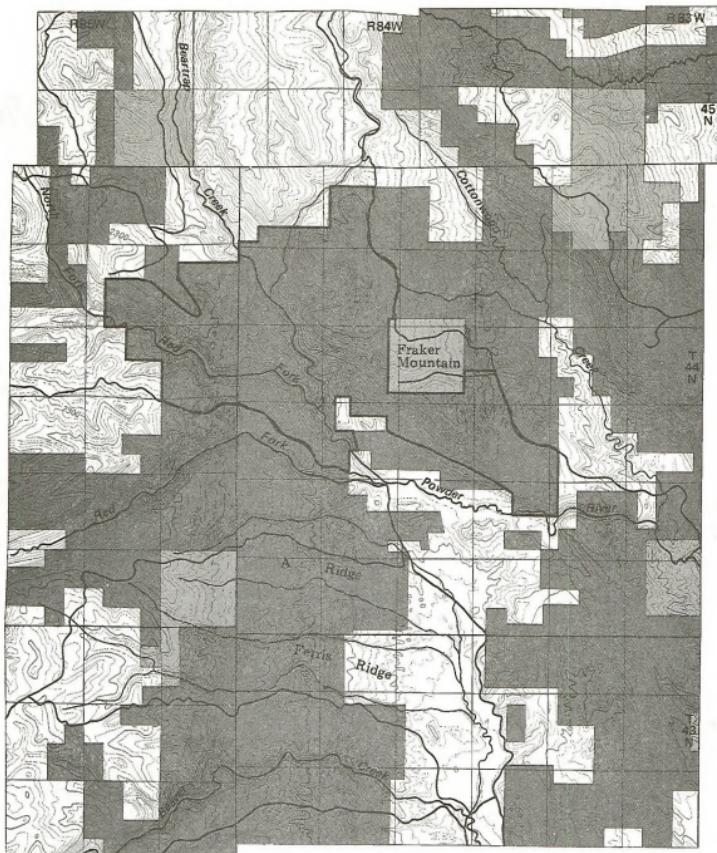
Nearness to Population Centers: The opportunities for solitude or primitive recreation within a day's drive of major population centers.

Geographic Distribution: A balance of geographic distribution of wilderness areas—how many designated wilderness areas are in the same geographic area as the area being considered?

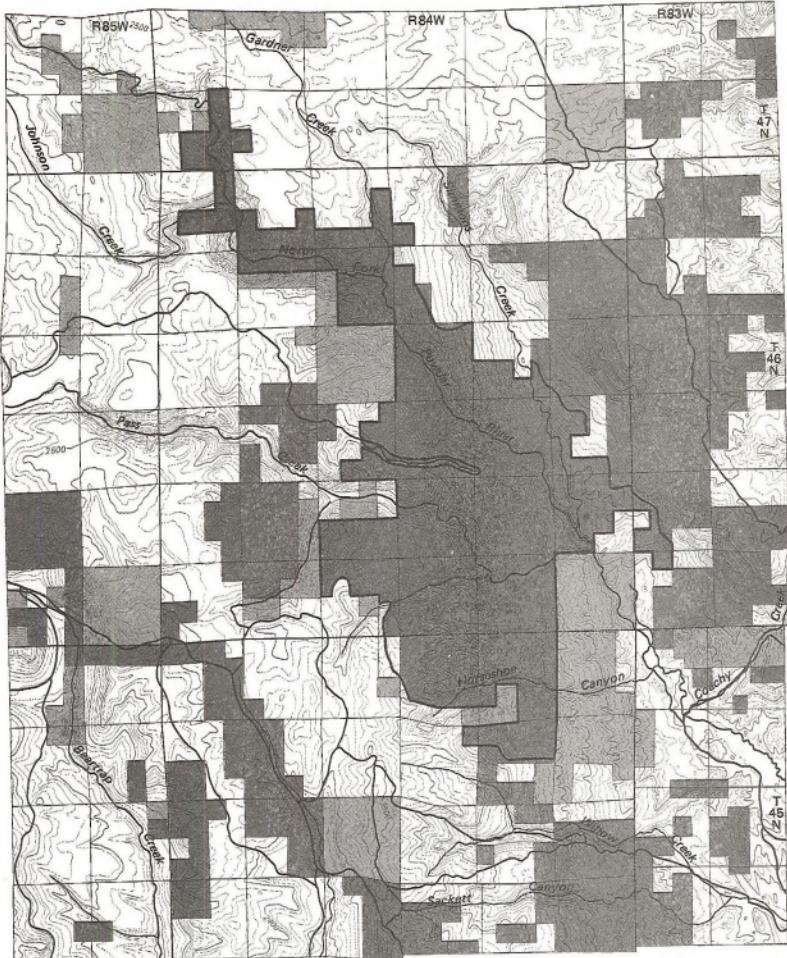
The Regional Wilderness map in the map volume shows other wilderness areas in this region.

Manageability

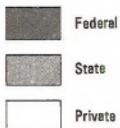
In evaluating a WSA, the BLM also must consider whether the area is capable of being effectively



Surface Ownership
Gardner Mountain

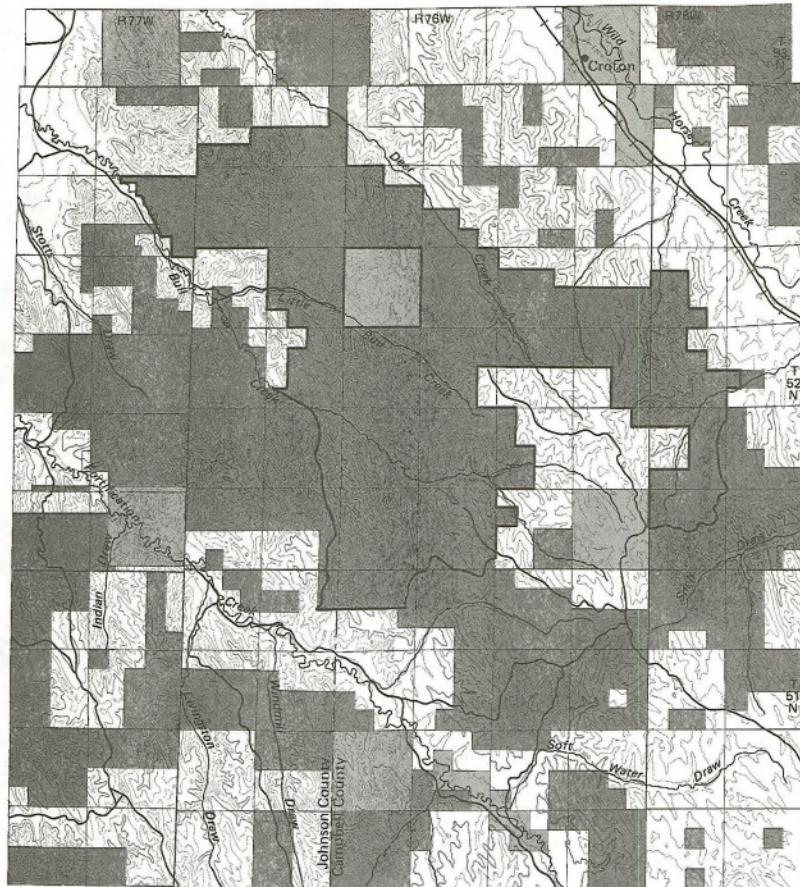


— Wilderness Study Area Boundary



0 1 2 3 4
Miles
Contour Interval 20 Meters

Surface Ownership
North Fork



Wilderness Study Area Boundary

- Federal
- State
- Private

0 1 2 3 4
Miles
Contour Interval 20 Meters

Wilderness

managed to preserve its wilderness character over the long term.

Study

During the study phase, the BLM determines through careful analysis which study areas will be recommended as suitable for wilderness designation and which will not. Recommendations for the three areas being studied for wilderness are being made through the BLM's multiple resource planning process, according to the criteria and quality standards listed in chapter 1 under "Planning Criteria." The BLM's planning regulations and its final wilderness study policy guided the study process.

Reporting

The reporting phase begins after completion of the draft RMP/EIS, when a wilderness study report (WSR) and a preliminary final EIS will be prepared to address the results of the study and make the preliminary recommendations as to suitability or nonsuitability of each WSA. The report will summarize the planning documents, the EIS, and the results of public participation.

All recommendations of WSAs as suitable or nonsuitable for designation as wilderness will be reported through the director of the BLM to the Secretary of the Interior, and through the Secretary of the Interior to the President, who will make his recommendation to Congress. Only Congress can designate an area as wilderness.

Interim Management

Until Congress acts, the BLM's *Interim Management Policy and Guidelines for Lands Under Wilderness Review* (1979a [rev. 1983]) serves as the principal document for managing the three WSAs in the Buffalo Resource Area. The goal of the *Interim Management Policy* is to ensure that the wilderness qualities inherent to each WSA are unchanged at the time that Congress makes its final decisions.

Alternatives, Including the Proposed Action

Formulation of Alternatives

The RMP developed four major alternatives that projected different combinations of public land uses and management schemes to respond to the identified planning issues. Within these four alternatives, an alternative was developed for each area being studied for possible wilderness designation.

The BLM's wilderness study policy requires that a wilderness study/EIS address at least three alternatives—no wilderness, "no action," and all wilderness—for each area under wilderness consideration. In addition to those required alternatives, other alternatives were introduced during the scoping process to provide a full range of management options.



Wilderness

Alternatives Eliminated from Detailed Study

A "conflict resolution" alternative was introduced for each study area during the scoping process. Each of these alternatives would have recommended wilderness designation for part of the WSA involved. Although they were initially considered, the conflict resolution alternatives for the three areas were not considered in detail in the EIS process.

The conflict resolution alternative for Gardner Mountain would have removed a commercial forest stand (approximately 750 acres) from the WSA. The reduced size and irregular configuration of the remaining unit would have resulted in an unmanageable WSA with a greatly reduced area for solitude.

Under the conflict resolution alternative considered for the North Fork WSA, about 2,450 acres of commercial forestland would have been removed from the unit to allow for commercial development. That acreage, approximately 6% of the BLM-administered commercial forestland in the resource area, is considered insignificant. Removal of that land from the WSA would have impaired wilderness characteristics by reducing the opportunities for experiencing solitude and primitive recreation.

The conflict resolution alternative considered for the Fortification Creek WSA would have changed the boundaries to allow development of three oil and gas leases within the WSA. Each lease carries a wilderness stipulation that requires that nonimpairment criteria be met by all surface activities. To meet the nonimpairment criteria, lessees would have to drain the reserves within the WSA boundary by directional drilling and drainage from locations outside the WSA. Since this is a feasible approach to developing the oil and gas resource, there was no reason to redefine the boundaries of the WSA to exclude these leases.

In addition, this alternative would have eliminated 960 acres containing 50 million tons of coal with development potential. However, since approximately 70 billion tons of federal coal is currently available for new leasing consideration, the 50 million tons (0.07%) is insignificant.

Alternatives Considered in Detail

The alternatives described in this appendix for each WSA correspond to those described for the entire Buffalo Resource Area in the RMP/EIS. Alternative A is the "no action" alternative in that document; therefore, Alternative A in this appendix is the "no action" alternative for the WSAs.

The "no wilderness" alternatives for the WSAs are included in Alternative B in the Buffalo RMP/EIS, which is the preferred alternative in that document. Alternative C in the Buffalo RMP/EIS also includes the "no wilderness" provision. For this reason, no separate Alternative C is presented here—the wilderness alternatives are designated "A," "B (and C)," and "D." Alternative D in the RMP/EIS includes the "all wilderness" provisions of the Alternative D presented in this appendix.

Alternative A: No Action

The "no action" alternative in this document for each WSA would continue present levels of resource use and management. Those alternatives represent the most likely conditions that could be expected in the future if resource use and management direction were to continue according to the direction prescribed in the management framework plan (MFP) that was prepared for the Buffalo Resource Area in 1979, and if the areas were not designated as wilderness.

When the MFP for the Buffalo Resource Area was being prepared in 1979, draft wilderness policy and review procedures had already been issued by the BLM. Because wilderness review was forthcoming, few planning decisions were made during the MFP process regarding management of programs in the Gardner Mountain, North Fork, and Fortification Creek WSAs. For this reason, the descriptions of the "no action" alternatives in this appendix do not include site-specific decisions for the management of forests, grazing, or wildlife habitat in any of the WSAs or for minerals management in Gardner Mountain or North Fork WSAs.

Under the "no action" alternative, grazing use in all three WSAs would continue at the current authorized level. The three areas would be available for recreation use. (Descriptions of recreation

Wilderness

management for each WSA cover only the decision made for off-road vehicle use and visual resource management.) Mineral exploration and development would be allowed, subject to appropriate applications. Minerals management for the Fortification Creek WSA would be subject to the stipulations in existing leases.

Alternative GM-A: Gardner Mountain, No Action

Fire Management. Full fire suppression would be practiced.

Recreation Management. Vehicle traffic would be limited to designated roads and vehicle routes, in accordance with the off-road vehicle (ORV) plan for Johnson County (USDI, BLM 1981f). The area would be managed as a Class II VRM area.

Alternative NF-A: North Fork, No Action

Management of fire and recreation would be the same as that described for the "no action" alternative for Gardner Mountain.

Alternative FC-A: Fortification Creek, No Action

Fire Management. Full fire suppression would be practiced.

Minerals Management. No oil and gas development is planned for lands in the Fortification Creek WSA; planning was constrained by the wilderness inventory process. Existing leases contain a stipulation that does not allow impairment of wilderness values. Therefore, they are not considered developable because reclamation of the areas could not be accomplished by the time the Secretary of the Interior makes his recommendation to Congress as to designation or nondesignation.

Recreation Management. Vehicle use in the Johnson County portion of the WSA would be limited to designated roads and vehicle ways. The Campbell County portion of the WSA would not be subject to any ORV designations because no ORV plan has been prepared for that county.

Management of the Fortification Creek WSA as a visual resource management (VRM) Class III area would continue.

Alternative B (and C): No Wilderness

Under the "no wilderness" alternatives, the three WSAs (a total of 28,931 acres) would be

recommended as nonsuitable for wilderness designation. The specific management direction for each WSA described below would be followed if Congress accepted the recommendations for nondesignation.

Alternative GM-B: Gardner Mountain, No Wilderness

Fire Management. Full suppression would be practiced in the present Gardner Mountain WSA under this alternative until a resource area fire management plan could be written. Fire suppression would be determined according to normal fire year procedure.

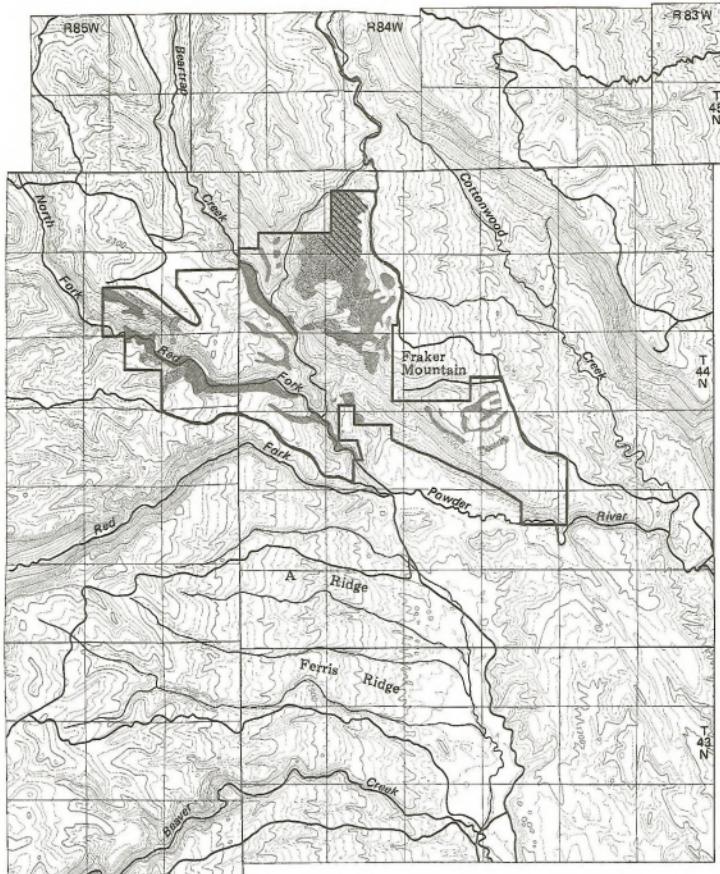
Forest Management. Under this alternative, approximately 750 acres of commercial forestland and 980 acres of woodland would remain in the allowable timber harvest base of the resource area. Therefore, the commercial forestland and woodland would be available for the application of all types of forest management activities such as timber harvesting, thinning, and planting.

A ten-year harvest plan to be prepared in about 1994 for the South Big Horn Mountains would call for a partial harvest of approximately 1 million board feet (MMBF) of overmature Douglas-fir by 2000. This harvest would cover approximately 250 acres of forestland in the "Arch" portion of the present Gardner Mountain WSA. The approximate locations of the timber harvest area and the access route are shown on the Timber Resources—No Wilderness map.

Grazing Management. Livestock grazing would continue to be authorized on allotments within the Gardner Mountain unit under Alternative GM-B, as shown in table AP 7-1.

The range improvement facilities listed in table AP 7-2 would be maintained by individual grazing lessees under provisions of the range improvement permit or cooperative agreement under which each program was authorized. The lessee would use materials similar to those in the existing projects and the most cost-effective methods.

Maintenance of fences normally would be done on foot or on horseback. However, a pickup truck might be required to transfer maintenance materials. Reservoir maintenance probably would require the use of heavy equipment and could require construction or improvement of the access route. Fences would normally require annual maintenance; maintenance work on reservoirs would be needed at five to ten-year intervals.



— Wilderness Study Area Boundary

0 1 2 3 4 Miles
Contour Interval 20 Meters

— Commercial Forest Lands—Suitable for Intensive Management (753 Acres)

— Woodlands—Not Suitable for Intensive Management (977 Acres)

— Future Timber Harvest Area

— Proposed Timber Harvest Access Route

Timber Resource
No Wilderness Alternative
Gardner Mountain

Wilderness

TABLE AP 7-1
GRAZING LEASES IN GARDNER MOUNTAIN WSA

Lease Number	Number and Kind of Livestock	Period of Use	Federal AUMs	Percentage of Lease within WSA
7058	1,000 sheep 100 cattle 10 horses	June 1-Nov. 30 June 1-Oct. 30 June 1-Feb. 28	129	04
7119	2,000 sheep	June 1-Oct. 1	136	55
7203	1,500 sheep 150 cattle	June 1-Dec. 1 June 15-Dec. 15	124	22

TABLE AP 7-2
RANGE IMPROVEMENTS IN GARDNER MOUNTAIN WSA

Project Number	Type	Units	Location	Normal Maintenance Interval (years)
4022	Fence	2 1/2 mi.	T44N, R84W, Secs. 8, 17, 21	1
4220	Reservoir	1	T44N, R84W, Sec. 15, SW 1/4 SW 1/4	10-15
none	Fence	1/4 mi.	T44N, R84W, Sec. 15	1
1088-B	Reservoir	1	T44N, R84W, Sec. 17, SE 1/4 SW 1/4	10-15
1092	Fence	1/4 mi.	T44N, R84W, Sec. 21, W 1/4 NW 1/4	1
none	Reservoir	1	T44N, R84W, Sec. 19, NW 1/4 NE 1/4	10-15
4717	Fence	1/2 mi.	T44N, R85W, Sec. 13, S 1/4 S 1/4	1
1095	Fence	1/2 mi.	T44N, R85W, Sec. 12, S 1/2	1

The grazing allotments in the Gardner Mountain unit have been classified in the "I" (improvement) category. Allotment management plans (AMPs) would be developed for allotments 7203 and 7058 within the next ten years and for allotment 7119 after 1994. The proposed AMPs would guide grazing management directions for the entire unit by creating a grazing management system.

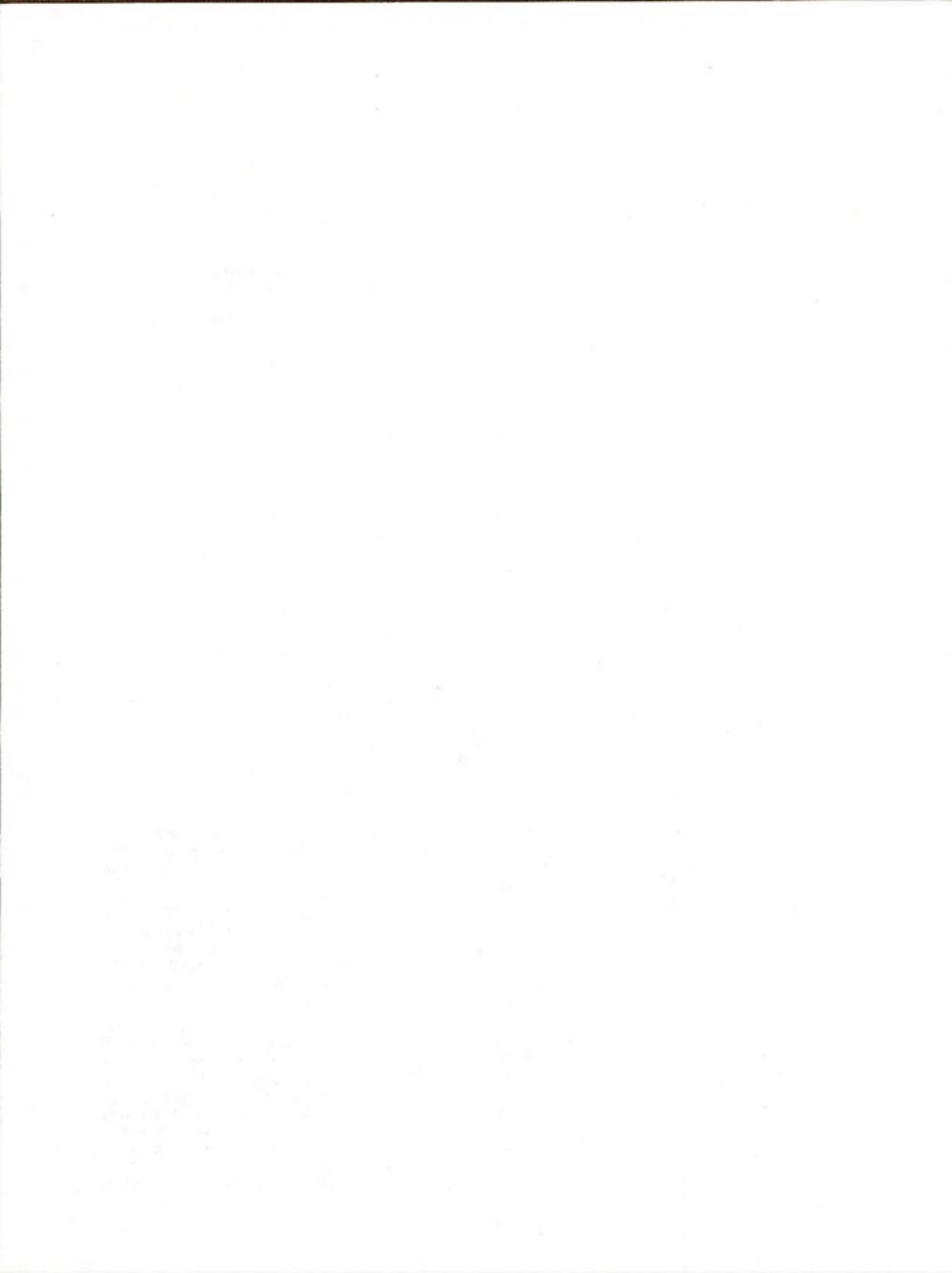
Range improvements tentatively planned under this alternative in conjunction with AMPs would be 1 1/4 mile of fence (1/4 mile within the present WSA), 1 mile of pipeline (3/4 mile within the WSA), and one well within the boundaries of the present WSA. The locations of the proposed facilities are shown on the Grazing Management map.

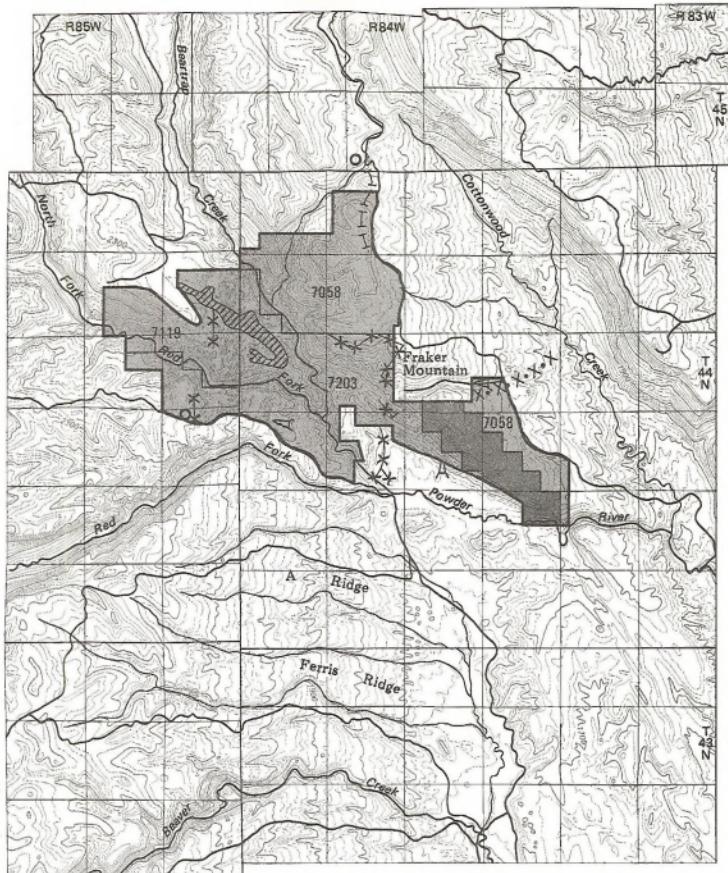
The final decision as to which projects would be developed, and their exact location, would be determined in the AMPs. An environmental assessment (EA) would be prepared in conjunction with each AMP. Range improvements would be

constructed with the most cost-effective and environmentally acceptable materials and methods, as stipulated in the EA and the record of decision.

Minerals Management. A total of 6,423 acres in the present Gardner Mountain WSA would be available for oil and gas leasing under this alternative, with appropriate stipulations (see the Oil and Gas/Watershed and the Oil and Gas/Wildlife maps for Gardner Mountain).

Recreation Management. Management of the Gardner Mountain WSA under Alternative GM-B would continue to provide a setting for semi-primitive motorized recreation. Access to the vicinity of the WSA would be provided by construction of a road and trail leading into the area from an existing county road. The road would result from a resource management plan decision to harvest commercial stands of timber outside the Gardner Mountain WSA boundary beginning in 1985.





Miles
0 1 2 3 4
Contour Interval 20 Meters

Wilderness Study Area Boundary



Unleased



Grazing Lease

Existing Range Improvements

 Fence

 Reservoir

Proposed Range Improvements

 Fence

Well

 Prescribed Burn

 Pipeline

Grazing Management
No Wilderness Alternative
Gardner Mountain



No Occupancy or Other Surface Disturbance will be allowed on slopes in excess of 25% without written permission from the Area Manager, Bureau of Land Management.



No Surface Occupancy



No Leasing

Entire Area:

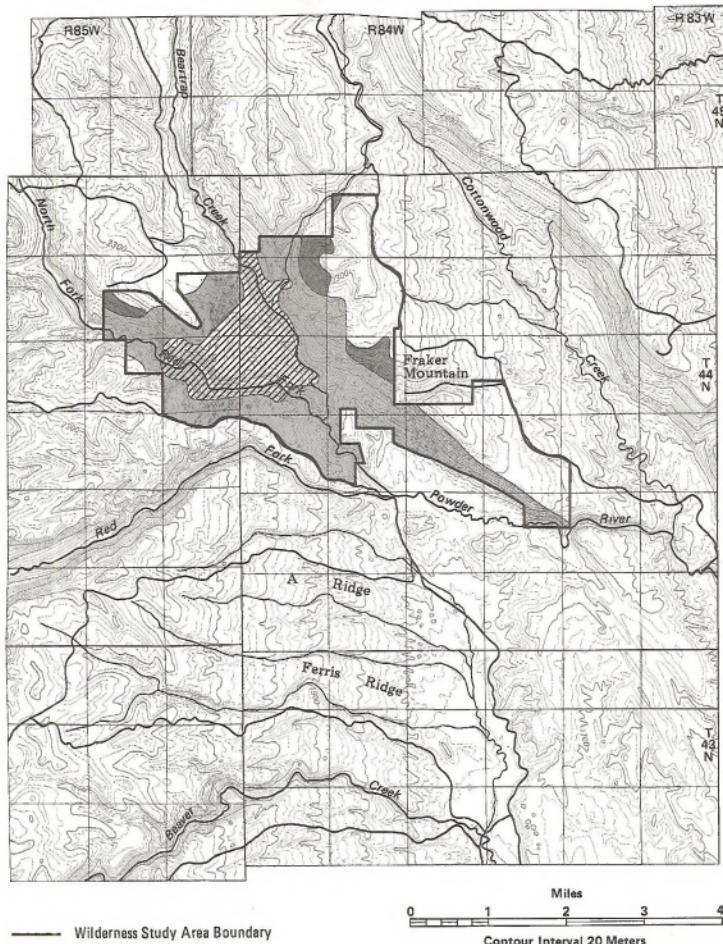
In order to minimize watershed damage—exploration, drilling, and other development activity will be allowed only during the period from June 15 to March 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management.

Entire Area:

Road and drill pad construction in stands of mountain browse (mountain mahogany, bitterbrush, serviceberry) will be avoided. If there is no possibility of placing a road or drill pad away from these stands of bush, then seedlings of the species disturbed must be planted in a density comparable to that in the adjacent undisturbed stand.

Entire Area:

When exploration is completed and no petroleum is found, or when a field is abandoned, all roads will be recontoured and reseeded with a mixture of grass and forbs (and brush in mountain areas). All abandoned roads will be barricaded and made unsuitable for vehicular travel.



— Wilderness Study Area Boundary

0 1 2 3 4
Miles
Contour Interval 20 Meters

Oil and Gas Lease Stipulations—Watershed
No Wilderness Alternative
Gardner Mountain



Critical Elk Winter Habitat—exploration, drilling, and other development will be allowed only during the period from May 1 to November 30. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management.



Buffer Zones and Appropriate Seasons-of-Use for known Eagle Nests and Prairie Falcon Nests.

Entire Area:

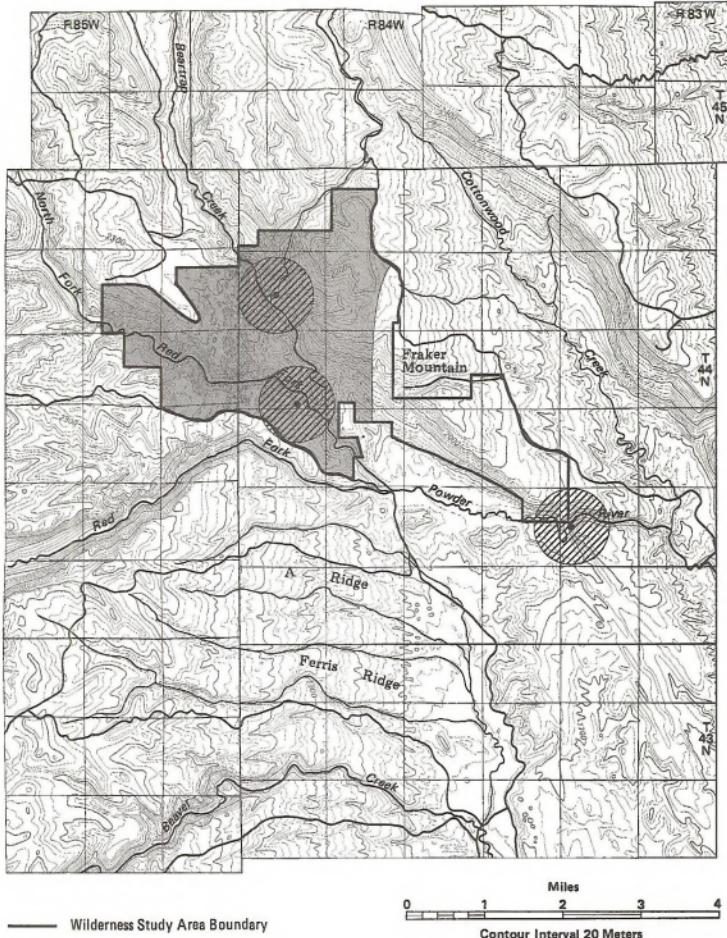
In order to minimize watershed damage—exploration, drilling, and other development activity will be allowed only during the period from June 15 to March 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management.

Entire Area:

Road and drill pad construction in stands of mountain browse (mountain mahogany, bitterbrush, serviceberry) will be avoided. If there is no possibility of placing a road or drill pad away from these stands of bush, then seedlings of the species disturbed must be planted in a density comparable to that in the adjacent undisturbed stand.

Entire Area:

When exploration is completed and no petroleum is found, or when a field is abandoned, all roads will be recontoured and reseeded with a mixture of grass and forbs (and brush in mountain areas). All abandoned roads will be barricaded and made unsuitable for vehicular travel.



— Wilderness Study Area Boundary

0 1 2 3 4
Miles
Contour Interval 20 Meters

**Oil and Gas Lease Stipulations—Wildlife
No Wilderness Alternative
Gardner Mountain**

Wilderness

A 5-mile hiking and horseback trail would lead west from the road into the WSA, and a parking area would be built on public land near the junction of the hiking trail and the access road (see the Gardner Mountain Recreation Access—No Wilderness map). Vehicle traffic would not be allowed beyond that point; entry to the adjacent public lands southeast of the proposed parking area would be by foot and horseback. The proposed hiking and horseback trail would follow existing roadbeds when they were available.

Easements would have to be acquired for the access route over private and state lands. If easements over the affected private lands could not be obtained, an alternative would be to construct an access route over public lands. It is assumed that easements over state land could be obtained.

Two primitive campgrounds would be developed in the vicinity to accommodate use if the anticipated demand is realized (see the Gardner Mountain Recreation Access—No Wilderness map).

Wildlife Management. A habitat management plan (HMP) to be developed in 1985 will include lands in the Gardner Mountain WSA. The plan would specify projects and locations for wildlife habitat improvement.

Alternative NF-B: North Fork, No Wilderness

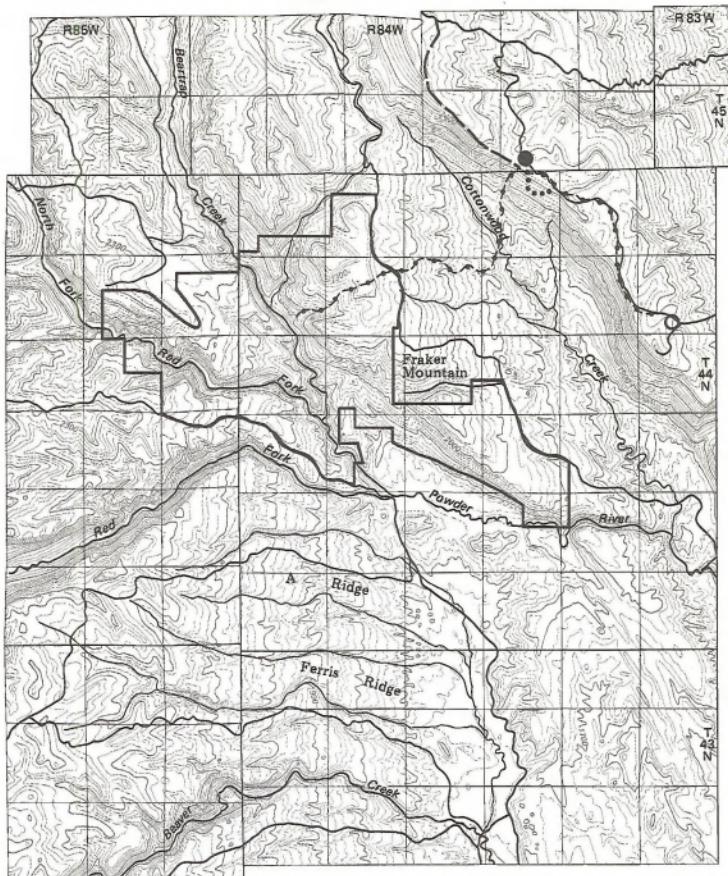
Fire Management. Full fire suppression would be practiced in the present North Fork WSA under this alternative until a resource area fire management plan could be written. Fire suppression would be determined according to normal fire year procedure.

Forest Management. Under this alternative, approximately 2,900 acres of commercial forestland and 3,950 acres of woodland would remain in the allowable timber harvest base of the resource area. Therefore, once a comprehensive forest management plan for the south Big Horn Mountains had been prepared and approved, the commercial forestland and woodland would be available for the application of all types of forest management activities such as timber harvesting, thinning, and planting.

The plan, which would be prepared in about 1994 as part of a comprehensive ten-year timber harvest plan for the South Big Horn Mountains, probably would call for a partial harvest of approximately 2 MMBF of overmature Douglas-fir by 2000. This harvest would cover approximately 400 acres of forestland in the Packsaddle Canyon portion of the present North Fork WSA. The



Courtesy of Wyoming Travel Commission



— Wilderness Study Area Boundary

0 1 2 3 4 Miles
Contour Interval 20 Meters

- Proposed Timber Access Route
- Proposed Horse and Hiking Trail
- ... Proposed Alternate Access Route
- Proposed Trail Head Parking
- Proposed Camping Area

Recreation Access and Development
No Wilderness Alternative
Gardner Mountain

Wilderness

approximate locations of the timber harvest area and the access route are shown on the Timber Resource map.

Grazing Management. Livestock grazing would continue to be authorized on allotments within or partially within the boundaries of the North Fork unit, as shown on table AP 7-3.

The range improvement facilities listed in table AP 7-4 would be maintained by individual grazing lessees under provisions of the range improvement permit or cooperative agreement under which each project was authorized. The lessees would use the most cost-effective methods and would use materials similar to those used on existing projects.

Maintenance of fences normally would be done on foot or on horseback. However, a pickup truck might be required to transport materials. Windmill maintenance would require a pickup truck and, occasionally, special equipment. Reservoir maintenance would generally require use of some type of heavy equipment. Fences and windmills would require minor annual maintenance; maintenance work on reservoirs usually would be needed at five to ten-year intervals.

Allotments 7196 and 7236 in the North Fork WSA have been classified as low priority "I" category allotments. Allotment 7283 was classified as a "C" (custodial) allotment. AMPs would be prepared after 1994 for the "I" allotments. Development of range improvement projects would be based on approved plans. No range improvements are proposed for the "C" allotment.

Range improvements tentatively planned under this alternative in conjunction with AMPs would be $\frac{1}{4}$ mile of pipeline and 1 mile of spring development, neither of which would be within the boundaries of the present WSA. The locations of the proposed facilities are shown on the Grazing Management map. The final decision as to which projects would be developed, and their exact locations, would be determined in the AMPs. An EA would be prepared in conjunction with each AMP. Range improvements would be constructed by the most cost-effective and environmentally acceptable methods and materials, as stipulated in the EA and the record of decision.

Minerals Management. A total of 10,089 acres in the present North Fork WSA would be available for oil and gas leasing under this alternative, with appropriate stipulations (see the Oil and Gas/Watershed and Oil and Gas/Wildlife maps for North Fork).

Recreation Management. Management of the North Fork WSA under Alternative NF-B would continue to provide a setting for semiprimitive motorized recreation. The Buffalo Resource area would try to obtain access into the unit (for foot and horseback travel only) through negotiations with owners of adjacent private land. Easements over state land also would be required.

If access could be acquired, the trail would follow an existing roadbed to a point where some new construction would be necessary (see the Recreation Access—No Wilderness map).

For the purposes of this analysis it is assumed that the desired easements and access could be acquired. If they could not, there would be no public access until the problem could be resolved.

A parking area would be constructed on public land outside the WSA near the junction of an existing county road and the trailhead. A primitive campground inside the WSA would be developed if the anticipated use is realized.

Wildlife Habitat Management. An HMP to be developed in 1985 will include lands in the North Fork WSA. The plan would specify projects and locations for wildlife habitat improvements.



Wilderness

TABLE AP 7-3
GRAZING LEASES IN NORTH FORK WSA

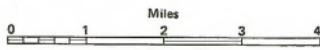
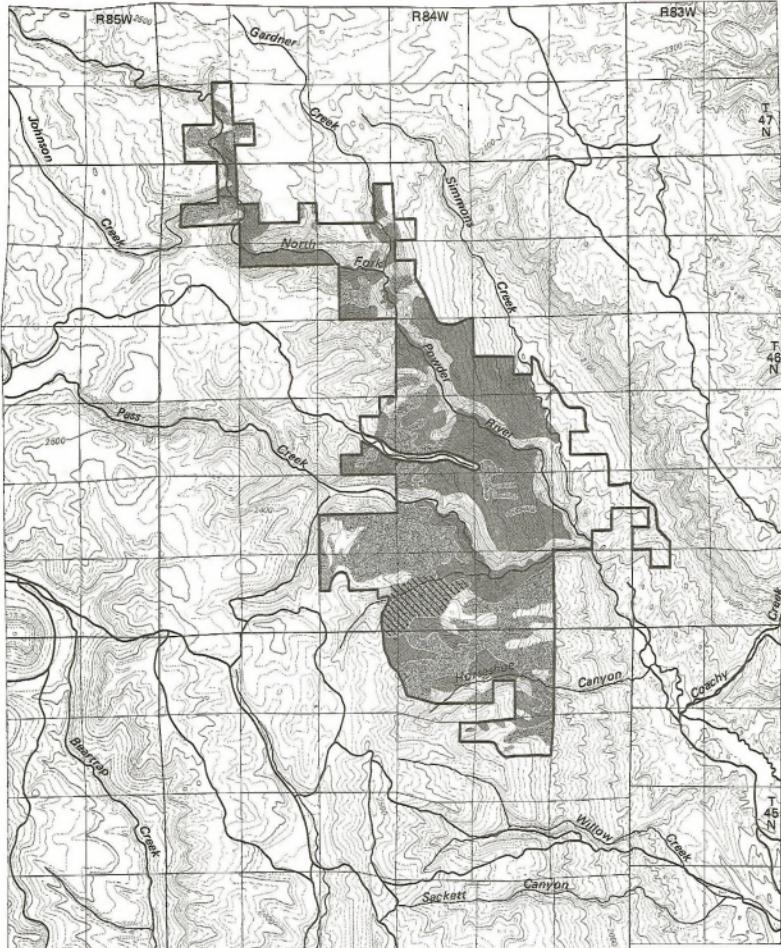
Lease Number	Number and Kind of Livestock	Period of Use	Federal AUMs	Percentage of Lease within WSA
7236	1,200 y/c cattle	Apr. 1-Oct. 15	310	62
7196	620 cattle	June 25-Oct. 10	565	53
7283*	1,800 sheep 50 cattle	June 15-Oct. 31	31	100

* Livestock use shown for mountain pasture portion of lease 7283.

TABLE AP 7-4
RANGE IMPROVEMENTS IN NORTH FORK WSA

Project Number	Type	Units	Location	Normal Maintenance Interval (years)
292	Fence	½ mi.	T45N, R84W, Secs. 10, 11	1
313	Fence	½ mi.	T45N, R84W, Secs. 2, 11	1
714	Fence	1 mi.	T46N, R84W, Secs. 25, 35	1
none	Reservoir	1	T46N, R84W, Sec. 11, NE $\frac{1}{4}$ NW $\frac{1}{4}$	10-15
1661	Reservoir	1	T46N, R84W, Sec. 34, SE $\frac{1}{4}$ SE $\frac{1}{4}$	10-15
1660	Windmill	1	T46N, R84W, Sec. 33, NE $\frac{1}{4}$ SE $\frac{1}{4}$	1
none	Fence	¾ mi.	T46N, R84W, Secs. 28, 33	1
4274	Fence	¾ mi.	T46N, R84W, Secs. 13, 14	1





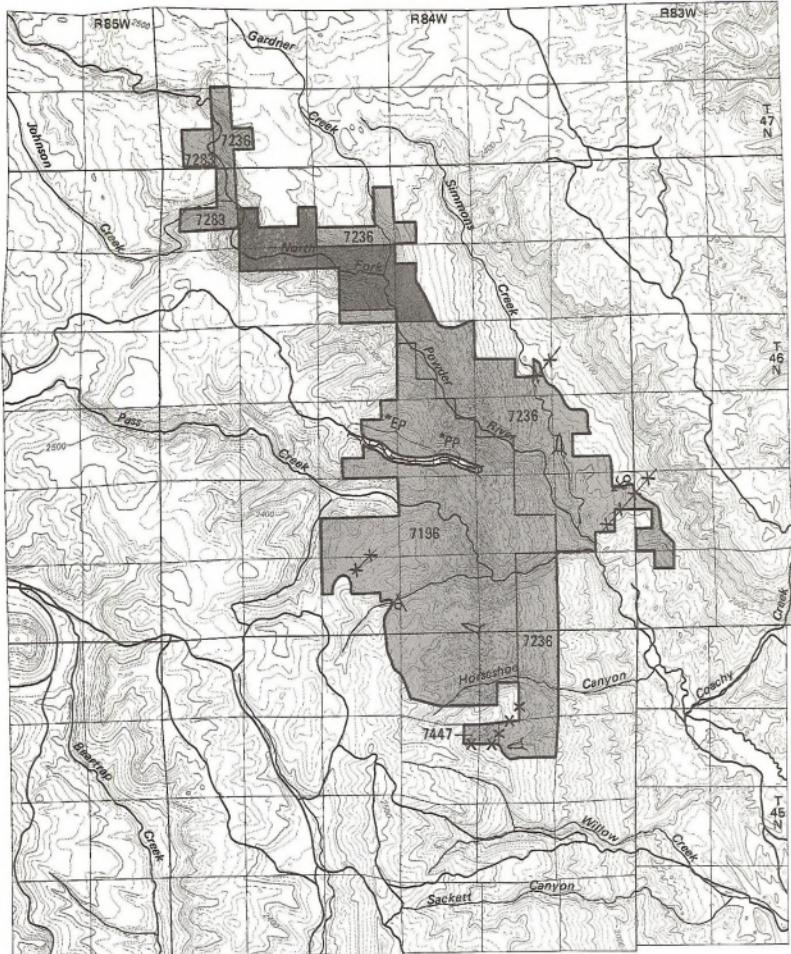
— Wilderness Study Area Boundary

— Commercial Forest Lands—Suitable for Intensive Management (2901 Acres)

— Woodlands—Not Suitable for Intensive Management (4000 Acres)

— Future Timber Harvest Area

Timber Resource
No Wilderness Alternative
North Fork



— Wilderness Study Area Boundary

■ Unleased

■ 7777 Grazing Lease

Existing Range Improvements

— X-X Fence

△ Reservoir

◊ Windmill

—+— Pipeline *(EP)

Proposed Range Improvements

—+— Pipeline *(PP)

↔ Spring

0 1 2 3 4
Miles
Contour Interval 20 Meters

Grazing Management
No Wilderness Alternative
North Fork



No Occupancy or Other Surface Disturbance will be allowed on slopes in excess of 25% without written permission from the Area Manager, Bureau of Land Management.



No Surface Occupancy



No Leasing

Entire Area:

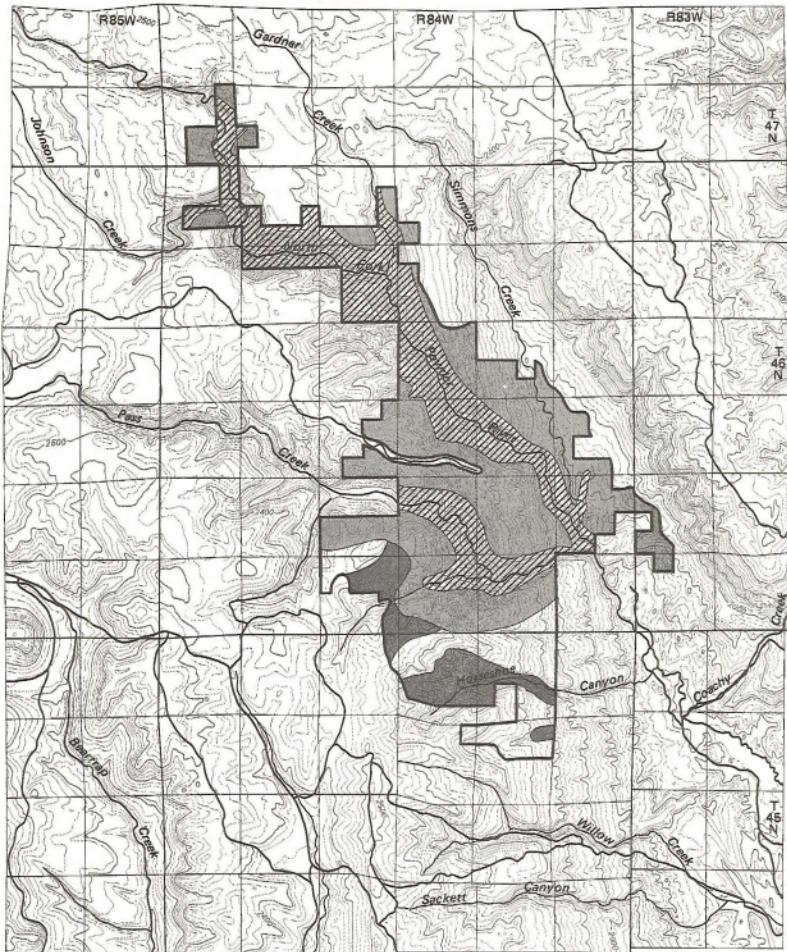
In order to minimize watershed damage—exploration, drilling, and other development activity will be allowed only during the period from June 15 to March 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management.

Entire Area:

Road and drill pad construction in stands of mountain browse (mountain mahogany, bitterbrush, serviceberry) will be avoided. If there is no possibility of placing a road or drill pad away from these stands of bush, then seedlings of the species disturbed must be planted in a density comparable to that in the adjacent undisturbed stand.

Entire Area:

When exploration is completed and no petroleum is found, or when a field is abandoned, all roads will be recontoured and reseeded with a mixture of grass and forbs (and brush in mountain areas). All abandoned roads will be barricaded and made unsuitable for vehicular travel.



— Wilderness Study Area Boundary

0 1 2 3 4
Miles
Contour Interval 20 Meters

Oil and Gas Lease Stipulations—Watershed
No Wilderness Alternative
North Fork



Critical Elk Winter Habitat—exploration, drilling, and other development will be allowed only during the period from May 1 to November 30. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management.



Buffer Zones and Appropriate Seasons-of-Use for known Eagle Nests and Prairie Falcon Nests.

Entire Area:

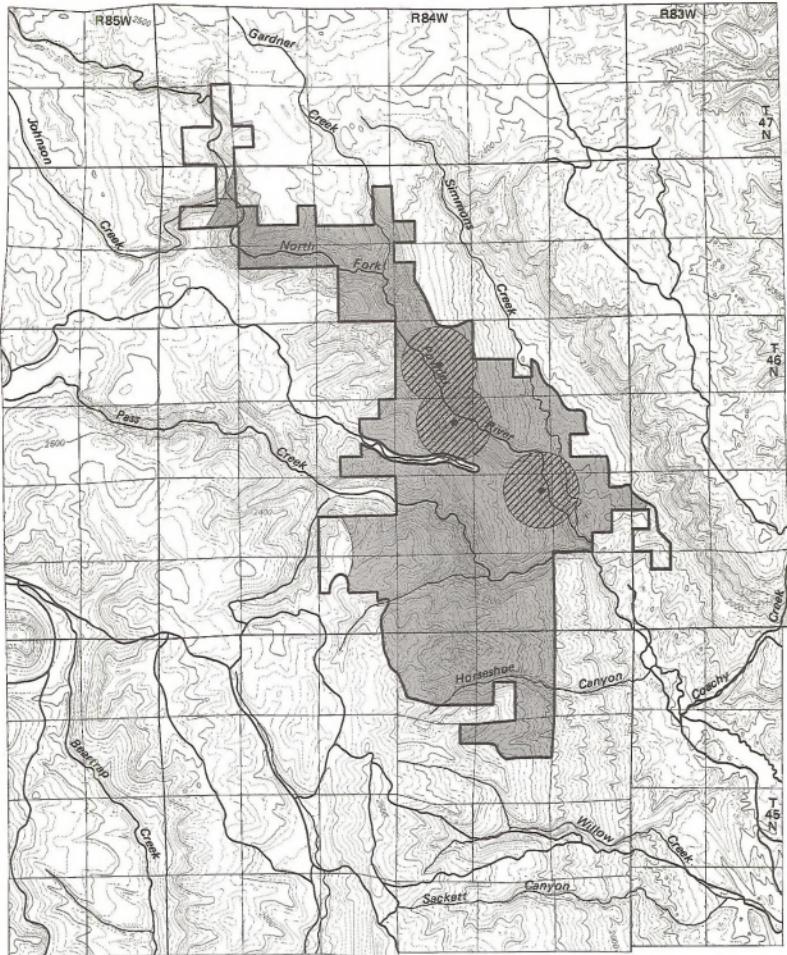
In order to minimize watershed damage—exploration, drilling, and other development activity will be allowed only during the period from June 15 to March 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management.

Entire Area:

Road and drill pad construction in stands of mountain browse (mountain mahogany, bitterbush, serviceberry) will be avoided. If there is no possibility of placing a road or drill pad away from these stands of bush, then seedlings of the species disturbed must be planted in a density comparable to that in the adjacent undisturbed stand.

Entire Area:

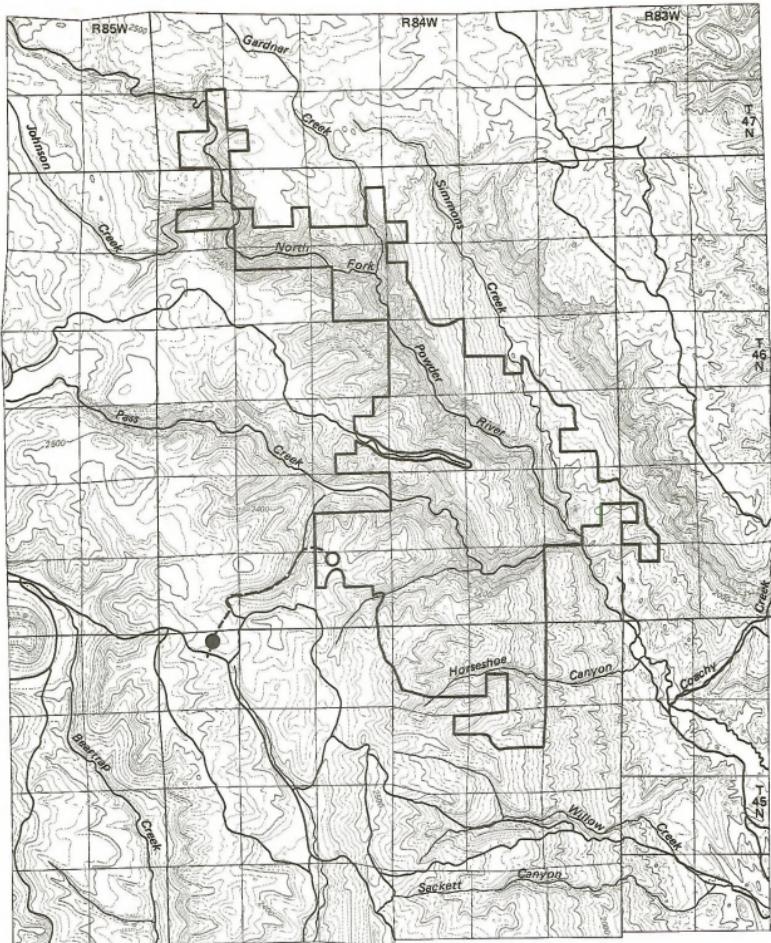
When exploration is completed and no petroleum is found, or when a field is abandoned, all roads will be recontoured and reseeded with a mixture of grass and forbs (and brush in mountain areas). All abandoned roads will be barricaded and made unsuitable for vehicular travel.



— Wilderness Study Area Boundary

0 1 2 3 4
Miles
Contour Interval 20 Meters

Oil and Gas Lease Stipulations—Wildlife
No Wilderness Alternative
North Fork



— Wilderness Study Area Boundary

0 1 2 3 4
Miles
Contour Interval 20 Meters

— Proposed Horse and Hiking Trail

● Proposed Trail Head Parking

○ Proposed Camping Area

Recreation Access and Development
No Wilderness Alternative
North Fork

Wilderness

Alternative FC-B: Fortification Creek, No Wilderness

Fire Management. Full fire suppression would be practiced in the present Fortification Creek WSA under this alternative until a resource area fire management plan could be written. Fire suppression would be determined according to normal fire year procedure.

Forest Management. Under Alternative FC-B, approximately 1,000 acres of woodland would become available for harvesting of minor forest products such as fuelwood and posts. Permits to harvest forest products would be issued on public demand. Harvests would be limited to not more than 10 cords of fuelwood and 50 posts over the entire area in any one year (see the Timber Resource map).

Grazing Management. Livestock grazing would continue to be authorized on allotments that are partially within the boundaries of the Fortification Creek unit, as shown on table AP 7-5.

Range improvement facilities listed in table AP 7-6 would be maintained by the individual grazing lessees under provisions of the range permit or cooperative agreement under which each project was authorized. The lessees would use materials similar to those used on existing projects and would use the most cost-effective methods.

Maintenance of fences normally would be done on foot or on horseback. However, where topography allows, a pickup truck might be used to transport materials. Annual maintenance usually is required for fences. Water projects and gully crossings could require maintenance several times each year, depending upon runoff levels and the effect of runoff on fences.

Allotments 7242 and 7171 in Fortification Creek WSA have been classified as "M" (maintain) category allotments. Allotment 7253 was classified "C." AMPs would be written for the "M" allotments, but not until 1994.

Range improvement projects proposed for the "M" allotments would be subject to approval of the AMPs. No new range improvements have been proposed for the "C" allotment. Four wells are tentatively planned under this alternative. They would be within the boundaries of the Fortification Creek unit. Their proposed locations are shown on the Grazing Management map. The approved projects would be constructed by the most cost-effective and environmentally acceptable methods. Materials would be those stipulated in the EA and the record of decision.

Minerals Management. Under this alternative, all 12,419 acres in the present Fortification Creek WSA would be available for oil and gas leasing, subject to the stipulations indicated on the Oil and Gas/Wildlife and Oil and Gas/Wilderness maps. Leasing would comply with the guidelines described in the Fortification Creek oil and gas plan (USDI, BLM 1982). Proposed locations and access routes are shown on the Proposed Oil and Gas Development Map. Coal development also would be possible, subject to the screening process described in appendix 2.

Recreation Management. No public access would be acquired into the Fortification Creek unit under Alternative FC-B. The area would be available for motorized recreational pursuits; however, access into the area would be at the discretion of the adjacent landowners. Vehicle use on the public lands would be limited to designated roads and routes. No recreational development would be carried out in the Fortification Creek unit.

Wildlife Habitat Management. The water projects described under "Grazing Management" for this unit would benefit wildlife as well as livestock because they would improve distribution.

Alternative D: All Wilderness

Under Alternative D, the "all wilderness" alternative, the three WSAs would be recommended for wilderness designation and managed in accordance with the BLM wilderness management policy. If Congress should disagree with these recommendations and not designate one or more of the areas as wilderness, the management of the area would revert to the management scheme described for Alternative B. Specific management direction for each WSA under wilderness designation is described below.

Alternative GM-D: Gardner Mountain, All Wilderness

Fire Management. Under Alternative GM-D, the interim fire management plan that was approved for Gardner Mountain WSA in March 1982 would be followed. However, minor alterations might need to be incorporated into the wilderness plan to be written to provide for conformance with the BLM's wilderness management policy.

Fixed-wing aircraft, helicopters, ground pumpers, and hand crews would be used for fire control. Cross-country travel would be permitted only when the terrain and soil conditions would permit such travel without damage to vegetative

Wilderness

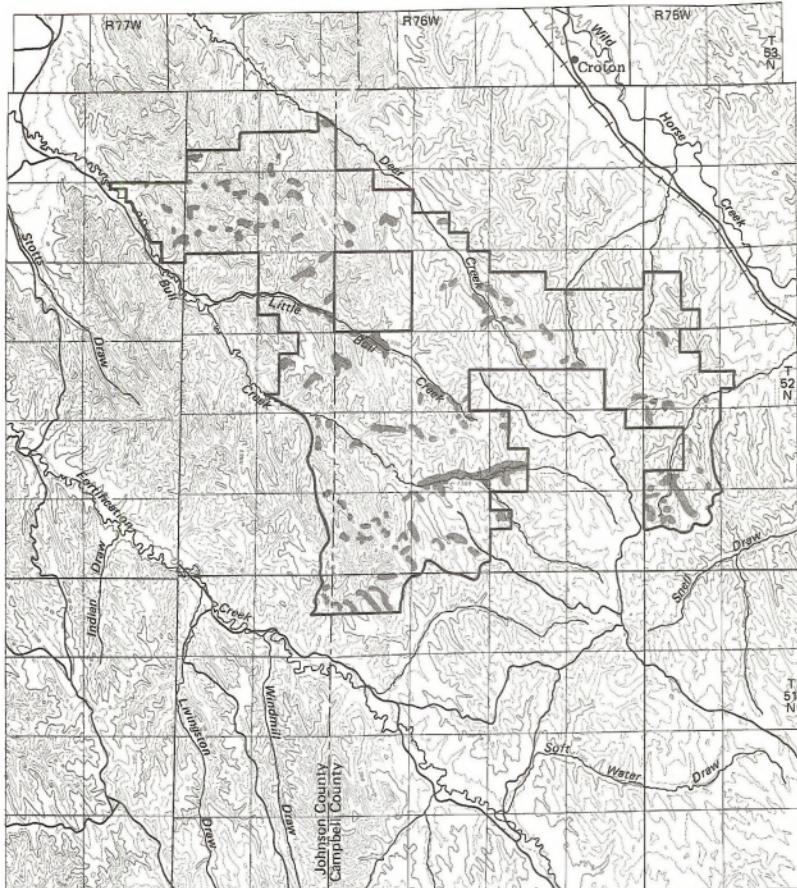
TABLE AP 7-5
GRAZING LEASES IN FORTIFICATION CREEK WSA

Lease Number	Number and Kind of Livestock	Period of Use	Federal AUMs in WSA	Percentage of Lease within WSA
7171	300 cattle	Oct. 1-April 15	764	83
7242	266 cattle	Nov. 1-March 31	548	25
7253	200 cattle	Oct. 1-March 31	40	31

TABLE AP 7-6
RANGE IMPROVEMENTS IN FORTIFICATION CREEK WSA

Project Number	Type	Units	Location	Normal Maintenance Interval (years)
1324	Fence	1 1/4 mi.	North and west boundary of Sec. 34, T52N, R76W	1
1454	Fence	4 3/4 mi.	T52N, R76W, Secs. 6, 8, 15, 22, 27	1
1464	Fence	1/4 mi.	North boundary of Sec. 33, T52N, R76W	1





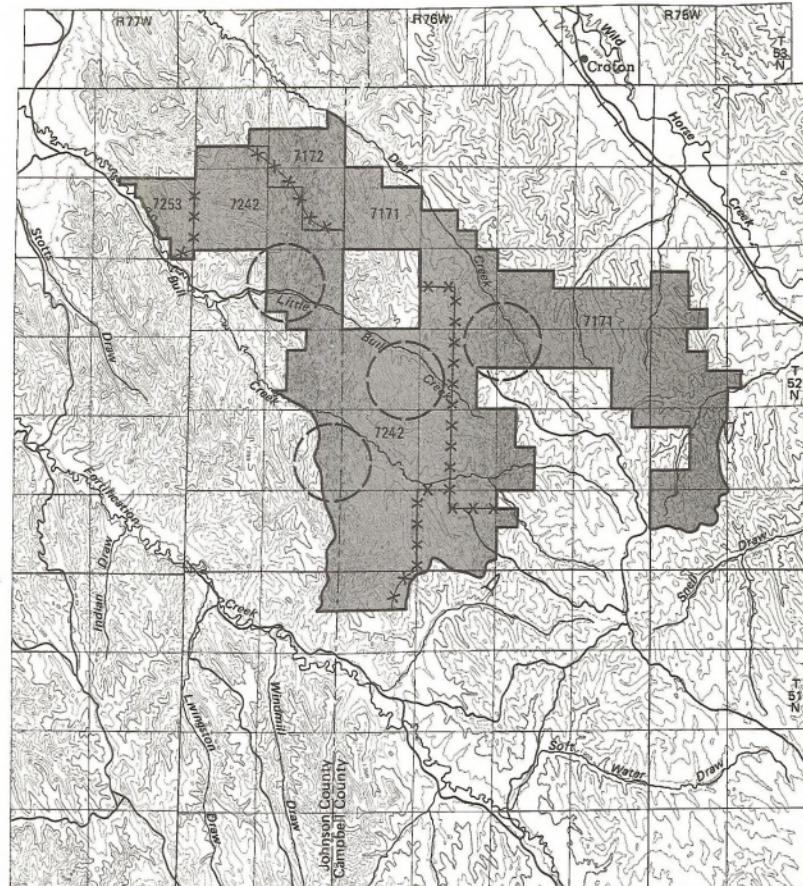
— Wilderness Study Area Boundary

Woodlands—Not Suitable for Intensive Management (1000 Acres)

0 1 2 3 4
Miles
Contour Interval 20 Meters

Timber Resource
No Wilderness Alternative
Fortification Creek





— Wilderness Study Area Boundary

7777 Grazing Lease

Existing Range Improvements

— X — Fence

△ Reservoir

Proposed Range Improvements

Proposed Areas for Water Development

Grazing Management
No Wilderness Alternative
Fortification Creek



Fragile Watershed/Steep Topography



No Occupancy or Other Surface Disturbance will be allowed on slopes in excess of 25% without written permission from the Area Manager, Bureau of Land Management.

Entire Area:

In order to minimize watershed damage—exploration, drilling, and other development activity will be allowed only during the period from June 15 to March 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management.

Entire Area:

To maintain aesthetic values, all semi-permanent facilities may require painting or camouflage to blend the natural surroundings. The paint selection or method of camouflage will be subject to approval by the Area Manager, Bureau of Land Management.

Entire Area:

No disturbance of Juniper

Entire Area:

All electrification will be by buried cable unless there are overhead powerlines in the vicinity.

Entire Area:

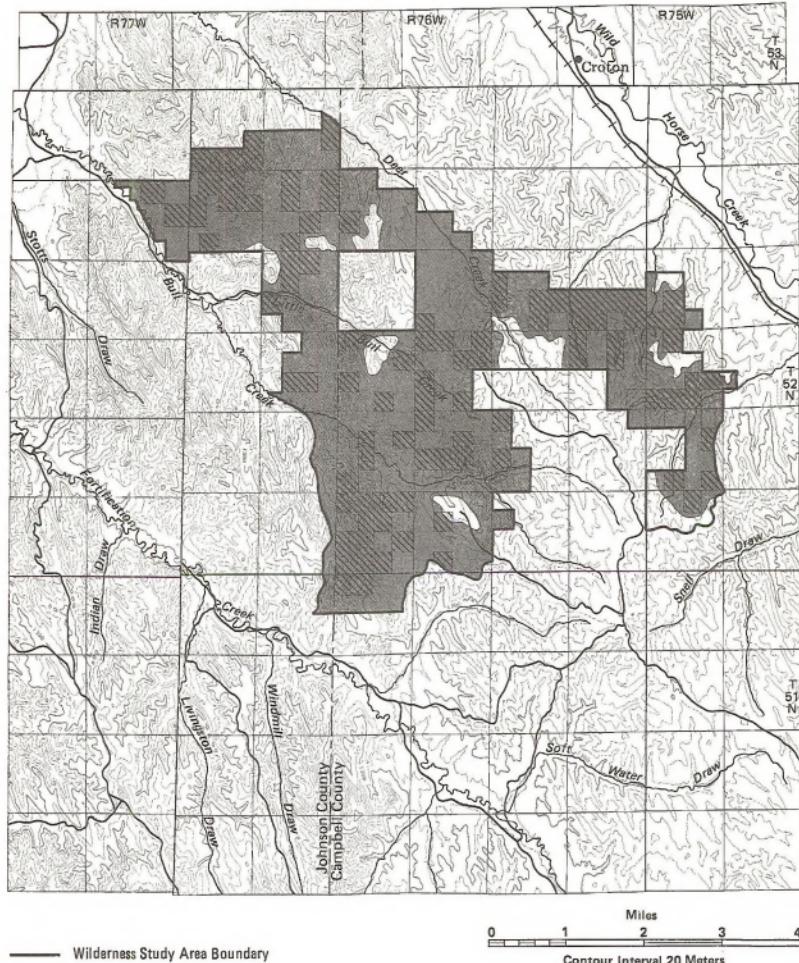
Engines powering production equipment will be muffled so the decible level will not exceed 86 when measured 50 feet from the source.

Entire Area:

Upon completion of rehabilitation work at a dry hole or abandoned well on Federal Surface, the lessee/operator will fence the entire location for two growing seasons to prevent livestock grazing. Exclusion of livestock from the site for two growing seasons by other means is an acceptable alternative to fencing.

Entire Area:

During rehabilitation of dry holes, abandoned wells, or unused portions of producing locations, mulching with two tons per acre of hay, straw, or excelsior wood fiber and/or soil retention blankets or nettings made of paper, jute, cotton or biodegradable plastic will be used on all areas of surface disturbance in sandy soil. As an alternative to mulching, a nurse crop of annual cereal (barley or oats) may be used where annual precipitation equals or exceeds 14 inches.



**Oil and Gas Lease Stipulations—Watershed
No Wilderness Alternative
Fortification Creek**

 Critical Elk Winter Habitat—exploration, drilling, and other development will be allowed only during the period from May 1 to November 30. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management. Where production is established, the oil or gas will be piped to tank batteries outside the Critical Elk Winter Habitat.

 Critical Elk Calving Area

 Sharp-tailed Grouse Strutting Ground—no occupancy or other surface disturbance will be allowed within 250 yards of the center. No exceptions to this will be granted.

 Sharp-tailed Grouse Strutting/Nesting Grounds—exploration, drilling, and other development activity will be allowed only during the period from June 1 to February 28. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management.

Entire Area:

In order to minimize watershed damage—exploration, drilling, and other development activity will be allowed only during the period from June 15 to March 1. This limitation does not apply to maintenance and operation of producing wells. Exceptions to this limitation in any year may be specifically authorized in writing by the Area Manager, Bureau of Land Management.

Entire Area:

To maintain aesthetic values, all semi-permanent facilities may require painting or camouflage to blend the natural surroundings. The paint selection or method of camouflage will be subject to approval by the Area Manager, Bureau of Land Management.

Entire Area:

No disturbance of Juniper

Entire Area:

All electrification will be by buried cable unless there are overhead powerlines in the vicinity.

Entire Area:

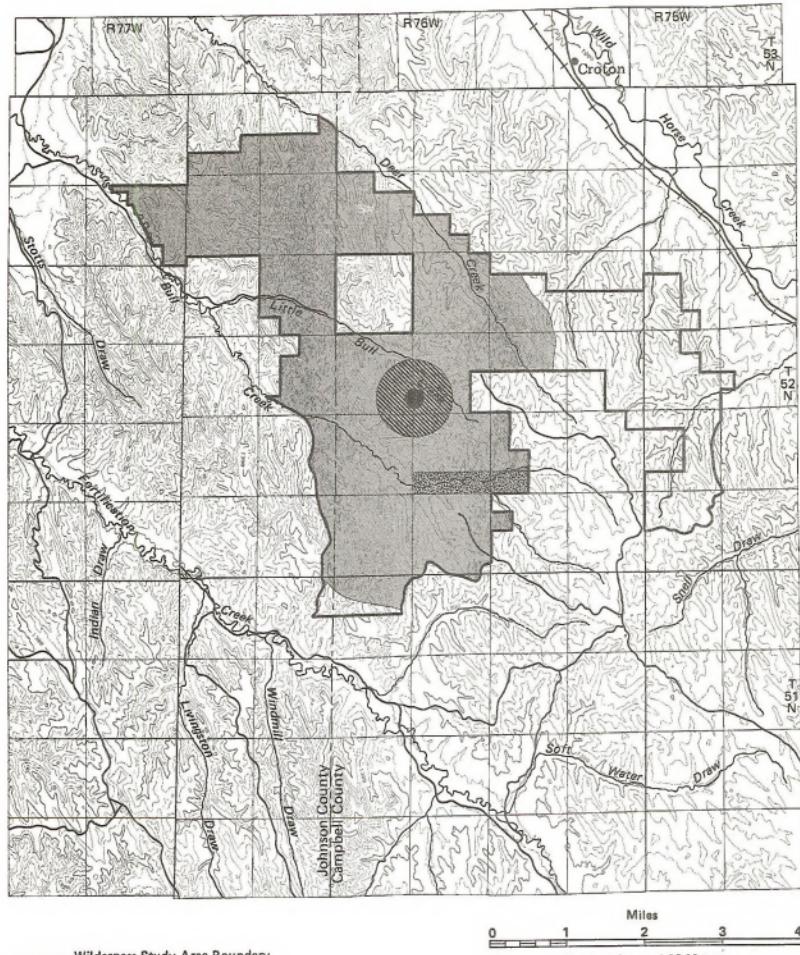
Engines powering production equipment will be muffled so the decible level will not exceed 86 when measured 50 feet from the source.

Entire Area:

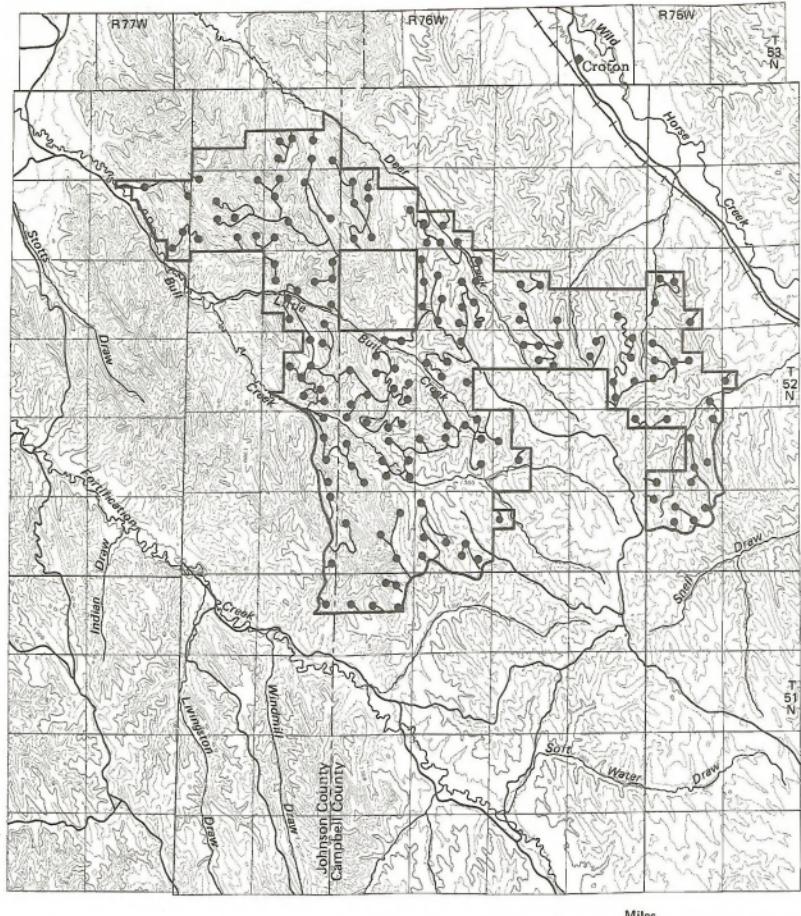
Upon completion of rehabilitation work at a dry hole or abandoned well on Federal Surface, the lessee/operator will fence the entire location for two growing seasons to prevent livestock grazing. Exclusion of livestock from the site for two growing seasons by other means is an acceptable alternative to fencing.

Entire Area:

During rehabilitation of dry holes, abandoned wells, or unused portions of producing locations, mulching with two tons per acre of hay, straw, or excelsior wood fiber and/or soil retention blankets or nettings made of paper, jute, cotton or biodegradable plastic will be used on all areas of surface disturbance in sandy soil. As an alternative to mulching, a nurse crop of annual cereal (barley or oats) may be used where annual precipitation equals or exceeds 14 inches.



**Oil and Gas Lease Stipulations—Wildlife
No Wilderness Alternative
Fortification Creek**



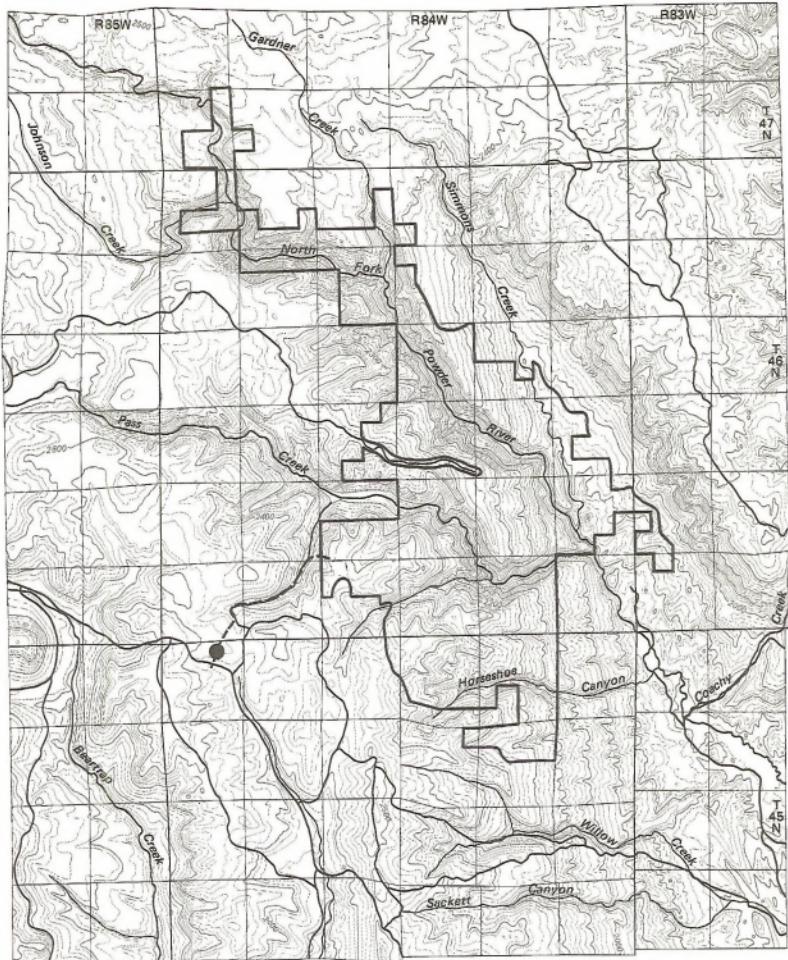
— Wilderness Study Area Boundary

0 1 2 3 4
Miles
Contour Interval 20 Meters

● Proposed Drilling Locations

~~~~ Proposed Access Routes

Proposed Oil and Gas Development  
No Wilderness Alternative  
Fortification Creek



— Wilderness Study Area Boundary

— Proposed Horse and Hiking Trail

● Proposed Trail Head Parking

0 1 2 3 4  
Miles  
Contour Interval 20 Meters

Recreation Access and Development  
All Wilderness Alternative  
North Fork

## Wilderness

cover. No heliport construction would be permitted, and heavy equipment such as tracked vehicles and dozers would not be permitted except to prevent loss of human life or to protect high-value property.

No roads or trails would be improved for fire management. Reclamation plans would be developed to protect wilderness characteristics.

*Forest Management.* Management of the forest cover under this alternative would be directed toward retaining the primeval character of the environment and allowing natural ecological processes to operate fully. Trees, shrubs, and other vegetative products would not be sold or cut for nonwilderness purposes except (1) on valid mining claims, (2) for certain administrative purposes such as construction and maintenance of authorized improvements, or (3) under emergency conditions such as fire or control of insects or disease. Reforestation generally would be prohibited, but in rare cases it might be approved by the director of the BLM to prevent deterioration or loss of the wilderness resource.

*Grazing Management.* Livestock grazing would continue to be authorized on allotments within the designated wilderness area at the rates shown in table AP 7-1 under Alternative B.

The range improvements listed in table AP 7-2 would continue to be maintained by the individual grazing lessees as described for Alternative B. All maintenance tasks within the designated wilderness area would be performed under the wilderness protection constraints set forth in the *Wilderness Management Policy* (USDI, BLM 1981g), as outlined below.

Before approving maintenance work on projects within the wilderness area, the BLM would complete an EA. On the basis of the analysis, unnecessary range improvements would be phased out and removed. Necessary maintenance work would be carried out with materials and construction methods specified in the EA.

Maintenance on improvements in the wilderness area normally would be accomplished without the use of motorized equipment. Exceptions to this policy could be approved case by case if practical alternatives to the use of motorized equipment were not available.

AMPS would be prepared according to the schedule outlined in Alternative B for the "I" allotments in the Gardner Mountain unit. The range improvements proposed in Alternative B in

conjunction with implementation of the AMPS also are tentatively included in this alternative. The final decision as to which projects would be developed, and their location, would be made through the allotment management planning process.

The portions of the proposed improvements that would be within the boundaries of the wilderness area (one well, including two water troughs;  $\frac{1}{4}$  mile of fence; and  $\frac{3}{4}$  mile of pipeline) would be subject to the following wilderness protection constraints, which would be applied during construction.

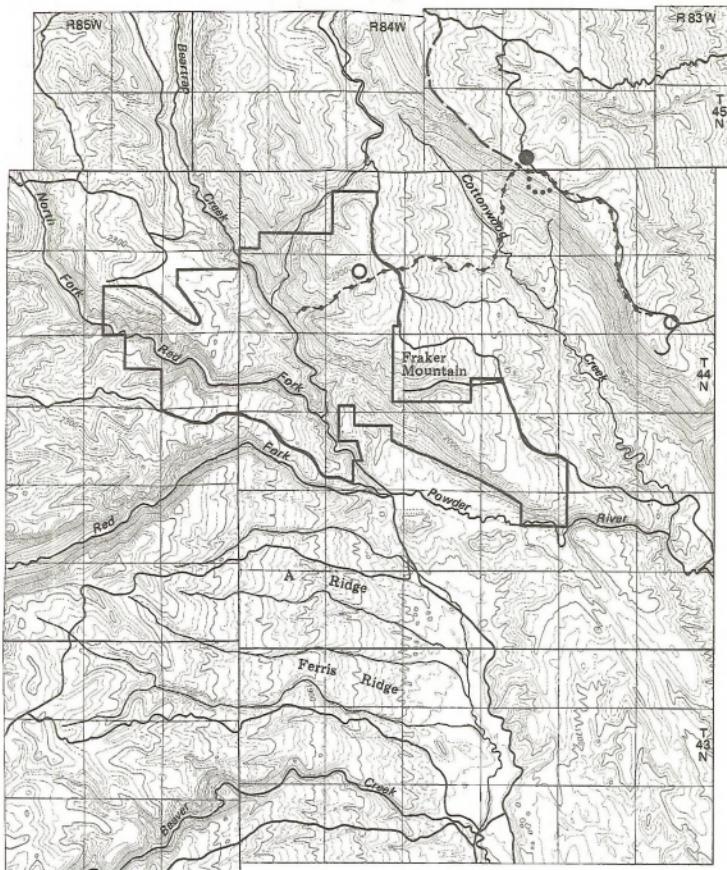
Natural materials would be used in construction of new range improvements unless the costs were unreasonable or the materials would not harmonize with the wilderness values. Fences would be post and pole or buck and pole, with no right-of-way clearing; the water troughs would be of redwood; a windmill with a wood tower would be erected at the well, and the pipeline would be buried, with no surface lines.

The use of motorized vehicles in the wilderness area would not be permitted for normal livestock management activities such as checking on or moving livestock. However, the use of motorized vehicles could be approved case by case for emergency actions such as removal of sick animals or placement of feed in emergencies.

*Minerals Management.* No mineral leases would be issued for land within the designated wilderness area. Congressional approval would be sought for leasing of oil and gas with a "no surface occupancy" stipulation. Should such approval be obtained, there would be no opportunity for a waiver of the "no surface occupancy" requirement. The land surface would be protected from any impairment.

*Recreation Management.* The area would be managed to provide a primitive setting and to allow nonmotorized recreational pursuits. Access provided into the area would be similar to that described for Alternative B. Visitor facilities such as a parking area and a primitive campground would be developed if needed on public land near Gardner Mountain, outside the WSA boundaries (see the Recreation Access—Wilderness map).

*Wildlife Habitat Management.* An HMP to be developed in 1985 will include lands in the Gardner Mountain area. HMP developments and projects would be constructed according to the BLM's wilderness management policy. Tentatively pro-



— Wilderness Study Area Boundary

Miles  
0 1 2 3 4  
Contour Interval 20 Meters

— Proposed Timber Access Route

— Proposed Horse and Hiking Trail

•••• Proposed Alternate Access Route

● Proposed Trail Head Parking

○ Proposed Camping Area

Recreation Access and Development  
All Wilderness Alternative  
Gardner Mountain

## Wilderness

posed projects are water developments on Fraker Mountain and in the area between Beartrap Creek and the Red Fork of Powder River.

### *Alternative NF-D: North Fork, All Wilderness*

**Fire Management.** Under Alternative NF-D, the interim fire management plan that was approved for the North Fork WSA in March 1982 would be followed. However, minor alterations to conform to wilderness policy might need to be incorporated into the wilderness plan that would be written in the event of wilderness designation.

Fire control in the wilderness area would be subject to the guidelines described for Gardner Mountain under Alternative GM-D.

**Forest Management.** Forest management in the North Fork unit under this alternative would be the same as that described for Gardner Mountain (Alternative GM-D).

**Grazing Management.** Livestock grazing would continue to be authorized on allotments within the designated wilderness area at the rates shown in table AP 7-3 under Alternative B.

The range improvements listed in table AP 7-4 (Alternative B) would continue to be maintained by the individual grazing lessees as described for Alternative B. As in Gardner Mountain, all maintenance tasks within the designated wilderness area would be performed under the wilderness protection constraints of the BLM's wilderness management policy, which are outlined under Alternative GM-D.

AMPs would be developed under this alternative as described for Alternative NF-B. However, should the AMPs identify the need for new range improvement projects, they would be constructed in accordance with the wilderness management policy. The following materials and methods of construction would be used for any new range improvements:

Natural materials would be used in construction of new range improvements unless the costs would be unreasonable or the materials would not harmonize with the wilderness values. Fences would be post and pole or buck and pole with no right-of-way clearing; water troughs would be of redwood; windmills with wood towers would be used; and pipelines would be buried, with no surface lines.

The final decision as to which projects would be developed and their exact locations would be determined in the EA prepared for each AMP.

Additional wilderness protection stipulations might have to be applied to construction of new range improvements on the basis of the analysis made in the EA.

The use of motorized vehicles in the North Fork wilderness area would not be permitted for normal livestock management activities. The use of motorized vehicles could be approved case by case for emergencies.

**Minerals Management.** No new mineral leases would be issued for land within the designated wilderness area. Congressional approval would be sought for leasing of oil and gas with a "no surface occupancy" stipulation. Should such approval be obtained, there would be no opportunity for a waiver of the "no surface occupancy" requirement. The land surface would be protected from any impairment.

Development of the two existing leases that cover a small portion of the North Fork unit would be permitted, subject to the wilderness stipulations.

**Recreation Management.** The unit would be managed to provide a primitive setting and to allow nonmotorized recreational pursuits. Access provided into the area would be similar to that described under Alternative B. However, no camping area is proposed inside the wilderness boundaries (see the Recreation Access-Wilderness Map).

**Wildlife Habitat Management.** An HMP to be developed in 1985 will include lands in the North Fork area. HMP developments and projects would be constructed according to the BLM's wilderness management policy.

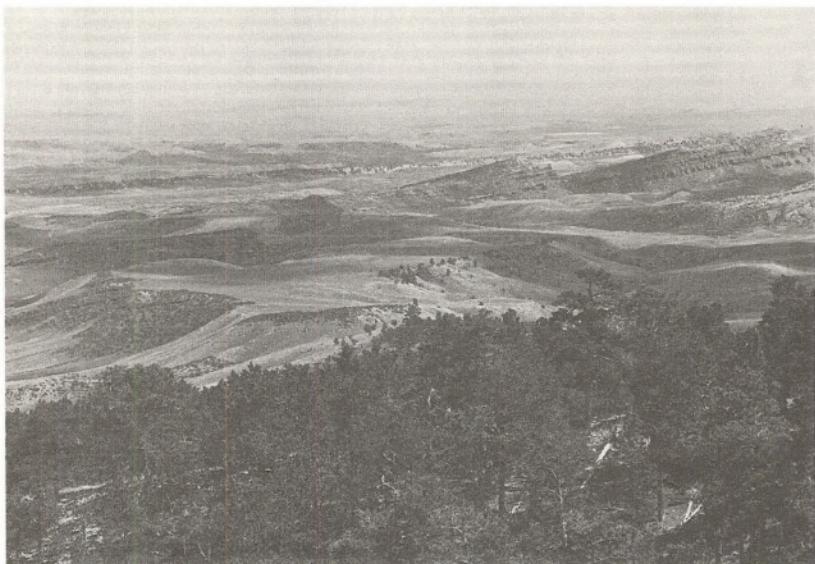
### *Alternative FC-D: Fortification Creek, All Wilderness*

**Fire Management.** Under Alternative FC-D, the interim fire management plan that was approved for the Fortification Creek WSA on March 19, 1982, would be followed for the wilderness area. Minor changes to the fire management plan might be necessary to conform with the wilderness management plan that would be written in the event of wilderness designation.

Fire control in the wilderness area would be subject to the guidelines described for Gardner Mountain (Alternative GM-D).

**Forest Management.** Management of the forest cover under this alternative would be aimed at retaining the primeval character of the environment and allowing natural ecological processes to

## Wilderness



operate freely. Trees, shrubs, and other vegetative products would not be sold or cut for nonwilderness purposes. Exceptions to this would be cutting for administrative purposes such as construction and maintenance of authorized improvements or for emergency practices such as control of fire, insects, or disease.

Reforestation generally would be prohibited, but in rare cases it might be approved by the director of the BLM to prevent deterioration or loss of the wilderness resource.

*Grazing Management.* Livestock grazing would continue to be authorized on allotments within the designated wilderness area at the rates shown in table AP 7-5 under Alternative B.

The range improvements listed in table AP 7-6 (Alternative B) would continue to be maintained by the individual grazing lessees as described for

Alternative B. As in Gardner Mountain, all maintenance tasks within the designated wilderness area would be performed under the wilderness protection constraints of the BLM's wilderness management policy, which are outlined under Alternative GM-D.

AMPs would be developed under this alternative as described for Alternative FC-B. No new range improvement projects would be constructed. Licensed use on the portions of allotments within the wilderness area would be maintained at current levels and periods of use.

As in Gardner Mountain and North Fork, the use of motorized vehicles in the Fortification Creek wilderness area would not be permitted for normal livestock management activities. The use of motorized vehicles could be approved case by case for emergency actions.

## Wilderness

*Minerals Management.* No new mineral leases would be issued for land within the designated wilderness area. Congressional approval would be sought for leasing of oil and gas with a "no surface occupancy" stipulation. Should such approval be obtained, there would be no opportunity for a waiver of the "no surface occupancy" requirement. The land surface would be protected from any impairment.

Development of the three existing leases that cover parts of the Fortification Creek unit would be permitted, subject to the wilderness stipulations.

*Recreation Management.* The unit would be managed to provide a primitive setting and to allow nonmotorized recreational pursuits. No public access to the area would be obtained; therefore, recreational use of the designated wilderness area would be limited to persons who could get permission from the owners to cross adjacent private property. No recreational or support facilities would be developed.

*Wildlife Habitat Management.* No wildlife projects are proposed for the Fortification Creek area under this alternative.

### Selection of the Preferred Alternative

The preferred alternative for each area was selected through the BLM's multiple use planning process, in which the criteria and quality standards of the BLM's wilderness study policy were applied. The preferred alternative of the RMP, Alternative B, recommends all three WSAs as nonsuitable for wilderness designation. Thus, the preferred alternatives as described herein are GM-B, NF-B, and FC-B.

### The Affected Environment

#### Gardner Mountain

##### Mandatory Wilderness Characteristics

###### Size

The Gardner Mountain WSA contains 6,423 acres. The WSA stands as an individual area not dependent on other lands for size integrity. There are no state or private land inholdings. One section (640 acres) of state land adjoins this WSA.

##### Naturalness

The Gardner Mountain WSA generally appears to have been affected by the forces of nature, with human influences substantially unnoticeable. Two major canyons are within its borders; the Red Fork of the Powder River and Beartrap Creek. These canyons, which contain steep, forested terrain, average between 600 feet and 800 feet in depth. The canyons are excellent examples of land that has retained its "primeval character."

Fraker Mountain, which is in the WSA, contains steep, forested topography interspersed with open, grass-covered fields. The southern portion of Fraker Mountain is spotted with vegetation, mostly juniper and sage.

Most of the existing human imprints in the Gardner Mountain unit are reservoirs and fences associated with range improvement projects. Outside sights and sounds have some effect in the southern and western parts of the WSA. Most impacts are associated with occasional views of ranch headquarters and low level military flights.

##### Outstanding Opportunities

Outstanding opportunities for solitude are available throughout the WSA because of the steep, rugged terrain. The two major canyons and the large percentage of forested terrain help provide an environment conducive to the solitude experience.



## Wilderness

The area also offers outstanding opportunities for users to participate in primitive and unconfined recreational activities such as hiking, fishing, hunting, sightseeing, photography, and horseback riding. However, the steep canyon walls offer limited access points into the canyons and, along with the rocky, sheer cliffs, form natural barriers that would affect human movement within the scenic portion of the unit.

### *Special Features*

Both the Red Fork of the Powder River and Beartrap Creek are considered "important trout waters—fisheries of regional importance" by the Wyoming Game and Fish Department. Bald eagles and peregrine falcons, both classified as endangered species, migrate through the area; however, none are known to nest in the area.

Also significant is the known presence of portions of the Dull Knife Battlefield, a site on the National Register of Historic Places, which extends into the WSA boundaries.

### *Multiple Resource Benefits*

Wilderness designation would ensure benefits to watersheds, soil, vegetation, and wildlife habitat by preventing the impacts associated with mineral development and timber harvesting. Approximately 1,730 acres of forestland would be preserved if this area was designated wilderness.

### *Diversity*

The Douglas-fir forest ecosystem, Rocky Mountain Forest province, in which the Gardner Mountain WSA is classified, is already well represented in the NWPS. Ten designated areas and 26 administratively endorsed areas are in this classification, as are 34 more areas still under study. (An "administratively endorsed" area is one that has been recommended for wilderness designation by a presidential administration.)

Opportunities for solitude or primitive recreation are prevalent within one day's drive from all the major population centers considered. Three standard metropolitan statistical areas (SMSAs) are within a day's drive of the study area: Fort Collins, Colorado; Billings, Montana; and Casper, Wyoming.

Table AP 7-7 summarizes wilderness characteristics of the three WSAs. Table AP 7-8 summarizes the primitive recreation opportunities available within 250 miles of the three population centers that are within one day's drive of the Gardner Mountain and North Fork WSAs.

The Rocky Mountain region contains on of the largest concentrations of designated and proposed wilderness in the country. The addition of the Gardner Mountain WSA to the NWPS would increase concentration rather than balance the distribution of wilderness on a national or regional basis. The Regional Wilderness map in the map volume shows the current wilderness distribution in the surrounding region, including all areas now under study as well as those already recommended to Congress for wilderness consideration.

### *Other Resource Values*

#### *Cultural Resources*

No systematic cultural resource survey has been conducted within the Gardner Mountain WSA boundary. However, a petroglyph site and a burial cave are known to exist in the unit.

Archeological site density in the Gardner Mountain WSA is expected to be approximately 5 to 10 sites per square mile on grassy open slopes. These sites will probably be small, open, limited activity areas, often with evidence of some primary or secondary quarrying. Canyon settings on lower slopes are expected to have significantly higher site densities. Sites here probably are chiefly larger open camps and rock shelters.

Historic sites in the Gardner Mountain WSA include Fraker Mountain, Fraker Pass, and portions of the Dull Knife Battlefield. The battlefield, which is listed on the National Register of Historic Places, was the scene of battle between the U.S. Cavalry and Cheyenne Indians in 1876.

#### *Forest Resources*

The Gardner Mountain WSA contains approximately 750 acres of commercial forestland and 980 acres of woodland. The commercial forestland contains approximately 4 MMBF of decadent sawtimber size old growth Douglas-fir and ponderosa pine. The potential full annual sustained yield harvest level of commercial forestlands is estimated at 55 thousand board feet (MBF). The total volume in the commercial forestland in the entire resource area, including forestlands administered by the Forest Service, is estimated at 1.5 billion board feet.

The woodland contains approximately 360,000 cubic feet of limber pine and ponderosa pine wood fiber. The potential full annual sustained yield harvest level of the woodland is estimated at 9,000 cubic feet (1 cubic foot equals 5.4 board feet). No timber harvesting is planned in the WSA in the next ten years.

## Wilderness

TABLE AP 7-7  
WILDERNESS SUITABILITY CRITERIA

| <u>WILDERNESS VALUES</u>          | <u>Gardner Mountain WSA<br/>WY-060-201 (6,423 acres)</u>                                                                                                                                                                        | <u>North Fork WSA<br/>WY-060-202 (10,089 acres)</u>                                                                                                                                                | <u>Fortification Creek WSA<br/>WY-060-204 (12,419 acrea)</u>                                                                                                                                                                                                                                                         |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Wilderness Characteristics</u> |                                                                                                                                                                                                                                 |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                      |
| Naturalness                       | Human influence is substantially unnoticed. Two major picturesque canyons traverse through its borders. Several fences and reservoirs within the unit are considered minor.                                                     | Primeval character of the WSA is highlighted by three spectacular deep canyons. Fences and constructed reservoirs in the WSA are substantially unnoticed. Several ranch roads serve as boundaries. | The WSA has been primarily affected by the forces of nature. Unit contains extensive fence lines, minor range improvements, and vehicle ways but they generally blend into the natural landscape. Several roads serve as boundaries.                                                                                 |
| Solitude/Primitive Recreation     | Forested terrain and rugged topography creates good opportunities for solitude in most of the WSA. The area offers outstanding opportunities for primitive and unconfined recreation such as hunting, fishing, and sightseeing. | WSA has diverse terrain and vegetative cover; natural characteristics offer outstanding opportunities for hunting, fishing and backpacking.                                                        | The WSA's broken, rolling topography provides an excellent opportunity to avoid the sights, sounds, and evidence of other people in the unit. Outside sights and sounds have a moderate impact on WSA. Primitive and unconfined recreation opportunities include hunting, hiking, backpacking, and horseback riding. |
| <u>Special Features</u>           |                                                                                                                                                                                                                                 |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                      |
|                                   | Unit provides yearlong range for mule deer and serves as important deer winter range. Parts of Dull Knife Battlefield, listed on National Register, are in the WSA.                                                             | Most of WSA is crucial winter yearlong range for elk. Numerous opportunities to view geological formations in canyons.                                                                             | Approximately 75% of WSA is considered crucial yearlong range for elk. Unit also provides important elk calving grounds. The entire WSA is considered important deer winter and year-long range.                                                                                                                     |
| <u>Multiple Resource Benefits</u> |                                                                                                                                                                                                                                 |                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                      |
|                                   | Designation would enhance primitive recreation opportunities and augment multiple use management of adjacent and nearby lands by protecting watershed and wildlife habitat.                                                     | Designation would enhance primitive recreation opportunities and augment multiple use of management of adjacent and nearby lands by protecting watershed and wildlife habitat.                     | Designation would enhance primitive recreation opportunities and aid in long-term maintenance of important wildlife habitat.                                                                                                                                                                                         |

WILDERNESS SUITABILITY CRITERIA  
(continued)

| <u>WILDERNESS VALUES</u>              | <u>Gardner Mountain WSA<br/>WY-060-201 (6,423 acres)</u>                                                                                                                                    | <u>North Fork WSA<br/>WY-060-202 (10,089 acres)</u>                                                                                                                                         | <u>Fortification Creek WSA<br/>WY-060-204 (12,419 acres)</u>                                                                                                                                                                                    |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>DIVERSITY IN NWPS</u>              |                                                                                                                                                                                             |                                                                                                                                                                                             |                                                                                                                                                                                                                                                 |
| <u>Natural Systems</u>                | No ecosystem/landform types that are not represented in greater quantity & quality elsewhere in region.                                                                                     | No ecosystem/landform types that are not represented in greater quantity and quality elsewhere in region.                                                                                   | Area is representative of Great Plains Short Grass Prairie Province/sagebrush steppe ecosystem. This ecosystem is not represented by any designated or administratively endorsed wilderness area in the NWPS. <sup>a</sup>                      |
| <u>Nearness to Population Centers</u> | Unit is within one day's drive of 3 SMSAs. <sup>b</sup> Opportunities for primitive recreation are within one day's drive of the major population centers considered.                       | Unit is within one day's drive of 3 SMSAs. <sup>b</sup> Opportunities for primitive recreation within one day's drive of the major population centers considered are numerous.              | Unit is within one day's drive of two SMSAs. <sup>b</sup> Opportunities for primitive recreation are within one day's drive of the major population centers considered are numerous.                                                            |
| <u>Geographic Distribution</u>        | Total of 3,027,472 acres of designated wilderness is within 200 miles of unit. Within same radius, 2,707,084 more acres has been endorsed. This WSA would be an insignificant contribution. | Total of 3,027,472 acres of designated wilderness is within 200 miles of unit. Within same radius, 2,707,084 more acres has been endorsed. This WSA would be an insignificant contribution. | No wilderness areas within 200-mile radius. Total of 3,119,126 acres designated wilderness is within 250 miles; 2,638,663 more acres endorsed.                                                                                                  |
| <u>MANAGEABILITY</u>                  | Unit is considered manageable, although small size and irregular shape limit management options.                                                                                            | Unit is considered manageable.                                                                                                                                                              | WSA is considered unmanageable under any alternative. Potential conflicts with energy development in and around WSA would affect long-term wilderness management. Access to private inholdings also would affect natural character of the area. |

a. National Wilderness Preservation System.

b. Standard Metropolitan Statistical Area, as defined by the Bureau of the Census, U.S. Department of Commerce.

## Wilderness

TABLE AP 7-8

SOLITUDE OR PRIMITIVE RECREATION OPPORTUNITIES  
NEAR POPULATION CENTERS WITHIN ONE DAY'S DRIVE FROM  
GARDNER MOUNTAIN AND NORTH FORK WSAs

| Population Center | Designated<br>Wilderness Areas |             | Areas Recommended<br>for Designation |             | Areas under<br>Study for Wilderness |             |
|-------------------|--------------------------------|-------------|--------------------------------------|-------------|-------------------------------------|-------------|
|                   | Number<br>of<br>Areas          | Acreage     | Number<br>of<br>Areas                | Acreage     | Number<br>of<br>Areas               | Acreage     |
| Fort Collins, CO  | 27                             | 2.7 million | 10                                   | 649,780     | 108                                 | 1.8 million |
| Billings, MT      | 11                             | 3.5 million | 38                                   | 7.3 million | 107                                 | 2.2 million |
| Casper, WY        | 18                             | 4.0 million | 35                                   | 3.6 million | 94                                  | 1.6 million |

### Grazing Resources

Portions of three livestock grazing leases lie within the Gardner Mountain WSA. On the basis of data from the Missouri River Basin (MRB) range survey, an estimated total of 389 AUMs of livestock forage is produced within these leased areas in the WSA as follows:

Lease 7058 includes approximately 1,900 acres within the Gardner Mountain WSA. About 129 AUMs of forage for livestock is produced by the leased land in the WSA. The BLM-managed public land inside the WSA is used in conjunction with approximately 6,400 acres of deeded land, 1,600 acres of state lease, and 7,300 acres of public land outside the wilderness boundary. The lease, including the portion within the WSA, is grazed by cattle and sheep from June 1 to November 30 and by horses from June 1 to February 28.

Lease 7119 includes approximately 1,180 acres inside the Gardner Mountain WSA, which produces an estimated 136 AUMs of forage for livestock use. The BLM acreage inside the WSA is used with approximately 1,700 acres of adjacent deeded lands and 1,000 acres of public land outside the WSA boundary. The lease, including the portion within the WSA boundary, is grazed by 2,000 sheep from June 1 to October 1.

Lease 7203 includes approximately 2,000 acres of BLM lands within the Gardner Mountain WSA, which provides about 124 AUMs of forage for livestock. The BLM-managed land inside the WSA is used in conjunction with approximately 5,000 acres of deeded lands, 640 acres of state lease, and 7,200 acres of public land outside the WSA boundary. The lease, including the portion

within the WSA boundary, is grazed by 1,500 sheep and 150 cattle from June 1 to December 15.

Approximately 1,300 acres of BLM-administered land within the Gardner Mountain WSA are not leased for livestock grazing. These lands, on steep hillsides and canyons at the south end of the WSA, are unsuitable for livestock use because of the excessive slope and the low volume of forage produced.

Existing range improvements within the Gardner Mountain wilderness study area are listed on table AP 7-2 in the "Alternatives" section of this appendix.

### Lands and Realty

The Gardner Mountain WSA contains 6,423 acres, all in public ownership at the southern end of the Big Horn Mountains. Additional public lands adjoin the WSA on the south and east (see the Surface Ownership map).

The WSA is approximately 60 miles northwest of Casper and 40 miles south and west of Buffalo. There is no public access to the unit by road or trail. Access is possible through a steep, narrow pattern of public land off the Mayoworth Slope in Johnson County; however, this route is unmarked and difficult to follow without trespassing on private land.

### Mineral Resources

**Leasable Minerals.** Geologic formations within the Gardner Mountain WSA have produced oil and gas from beneath the Powder River Basin. In the WSA, however, these formations are exposed at the surface and considered to have minimum

## Wilderness

potential for being host rocks for oil and gas. There were no oil and gas leases in the area as of October 1, 1983. Additional information is on available in the mineral report for Gardner Mountain, which is on file at the Buffalo Resource Area office.

**Locatable Minerals.** There are no known or suspected deposits of locatable minerals in economic quantities in the WSA. The potential for energy resources or critical mineral resources within the Gardner Mountain WSA is considered extremely low. As of October 1, 1983, no mining claims had been filed on minerals within the WSA. Additional information is available in the Gardner Mountain mineral report.

### Recreation Resources

Recreation use in the Gardner Mountain WSA is dispersed except in the vicinity of the canyons, which receive some concentrated use. The WSA provides a setting for semiprimitive motorized recreation activities. The area is characterized by a predominantly unmodified natural environment of moderately small size. Because the WSA is surrounded by private land, use levels are low (less than 500 visitor days per year). Owners of adjacent property often charge an access fee, or in some cases deny access. Most recreation use is associated with motorized hunting, but fishing, horseback riding, camping, and sightseeing also are popular activities.

The WSA is an excellent area for elk and deer hunting where participants have a high success ratio.

Streams in the WSA have been rated Class III fisheries (trout fisheries of regional importance) by the Wyoming Game and Fish Department. Because of the remoteness of the area, successful reproduction, and low public pressures, fishing is excellent.

The BLM has not initiated on-site management restrictions on visitor use or provided recreation facilities. Motorized travel is restricted to designated routes.

### Soil Resources

The soils in the Gardner Mountain WSA fall within three major categories. Loamy textured soils on gently sloping to moderately steep terrain predominate. These soils have dark surface layers caused by accumulations of organic matter. Such soils support a shrub-herbaceous community and are a prime source of forage. Their reclamation potential is good.

Also of major extent are very stony, shallow soils. These soils support a bunch grass community and have poor reclamation potential because of the stoniness.

Timbered soils are found on moderately steep to steep northerly facing terrain in much of the WSA. These soils are typically moderately deep



or deep, fertile, loamy soils with good reclamation potential.

Extremely steep escarpments of rock outcrop are found along the deeply incised major drainages. These landscapes accumulate very little or no soil because of the slope and the highly consolidated nature of the bedrock.

### Vegetation

The most widespread vegetation type consists of a big sagebrush-dominated shrub community with an understory dominated by grasses. The most common grasses in this vegetation type are western wheatgrass, bluebunch wheatgrass, and needlegrass. At higher elevations and on deep-soil sites, Idaho fescue and bluegrass are the most abundant grasses. On some sites, the big sagebrush may be replaced by or co-dominate with curlyleaf mountain mahogany or three-tip sage. The rest of the vegetation in the WSA is an open forest-shrub-grassland type, which is characterized by an overstory of ponderosa pine, limber pine, and Douglas-fir. The shrub component is dominated by curlyleaf mountain mahogany and big sagebrush, with understory vegetation of bluegrass and Idaho fescue.

### Water Resources

The principal drainages of the WSA are the North Fork of the Red Fork of the Powder River and Beartrap Creek, both of which are perennial. Four miles of the North Fork of the Red Fork of the Powder River and 2 miles of Beartrap Creek are within the WSA.

Although historical information is lacking, water quality in the Gardner Mountain WSA is considered good except during spring runoff, when sediment production is highest. Some water quality degradation occurs in the form of fecal pollution and increased sediment loads due to livestock grazing.

Existing information is limited to analysis of water samples taken from sites within the WSA in 1982 and 1983. The samples were analyzed for fecal coliform, fecal streptococci, and total coliform bacteria, all indicators of fecal pollution. They also were analyzed for major cations and anions, pH, total dissolved solids, and total suspended solids. The analyses show that the water is generally a calcium bicarbonate type low in both dissolved and suspended solids—a fairly high quality water suitable for most uses. Results of the analyses are on file at the Buffalo Resource Area office.

The major limitation of this initial study is sample size. Because sample size is small (from one to four samples per site), the results do not indicate annual averages or the effects of seasonal variation. Thus, the results represent only the quality of that water at the sampling point at the time that the sample was taken.

Most of the samples show livestock-caused fecal pollution. None of the samples show dominant human sources, and virtually none of the streams sampled are considered fit for human consumption without treatment.

The average annual flow of the North Fork of Red Fork (including Beartrap Creek) is 35.6 cubic feet per second (cfs), with a peak flow of 901 cfs. More detailed flow analysis on major streams within or near the WSA is available at the Buffalo Resource Area office.

The average annual precipitation in the WSA is approximately 16 inches.

### Wildlife Resources

**Fisheries.** The Gardner Mountain WSA contains the North Fork of the Red Fork of the Powder River and Beartrap Creek, which have been rated Class III fisheries. The major species in these streams are rainbow, brown, and brook trout (see table AP 7-9). Approximately 2 miles of Beartrap Creek within the WSA boundaries is in good condition. Approximately 4 miles of the North Fork of the Red Fork of the Powder River lies within the WSA, of which 2 miles is in fair condition and 2 miles is in good condition, according to BLM stream channel inventory.

**Big Game.** The Gardner Mountain WSA provides yearlong range for mule deer and serves as important deer winter range. It is estimated that 350 to 500 mule deer use this area in all seasons except winter, when the numbers may increase to as many as 700. The WSA also provides yearlong elk range. About 50 to 100 head of elk winter in this area.

Population numbers for mountain lion in the WSA are not known; however, ten lions were harvested in 1980 near Gardner Mountain. The Wyoming Game and Fish Department estimates that four to five pairs inhabit this general area; therefore, it is assumed that they probably range in this WSA.

Black bears can occasionally be found in the Gardner Mountain WSA.

## Wilderness

TABLE AF 7-9  
FISH HABITAT AND POPULATION DATA FOR STREAMS

|                         | Miles<br>BLM | Miles<br>State | Miles<br>Pvt. | Total<br>Miles | Major<br>Species   | Population Status<br>on BLM |
|-------------------------|--------------|----------------|---------------|----------------|--------------------|-----------------------------|
| North Fork of Red Fork  | 4.0          | 0              | 2.5           | 6.5            | BT, BrT, MS,<br>LD | 865 trout/mi<br>89 lb/ac    |
| Beartrap Creek          | 3.0          | 2.0            | 5.5           | 10.5           | RT, BrT            | 1,162 trout/mi              |
| Pass Creek              | 3.0          | 0.5            | 5.0           | 8.5            | BT, RT             | unknown                     |
| North Fork Powder River | 9.0          | 2.5            | 15.0          | 26.5           | RT, BT             | 1,813 trout/mi<br>320 lb/ac |

Source: Wyoming Game and Fish Department, 1978

Legend for Major Species

|                      |                                   |
|----------------------|-----------------------------------|
| RT - Rainbow Trout   | - <u>Salmo gairdneri</u>          |
| BT - Brown Trout     | - <u>Salmo trutta</u>             |
| BrT - Brook Trout    | - <u>Salvelinus fontinalis</u>    |
| MS - Mountain Sucker | - <u>Catostomus platyrhynchos</u> |
| LD - Longnose Dace   | - <u>Rhinichthys cataractae</u>   |

*High Interest Nongame Species.* Two golden eagle nest sites and one prairie falcon eyrie have been recorded in the Gardner Mountain WSA.

*Threatened and Endangered Species.* The BLM conducted an inventory of the Gardner Mountain WSA in 1980 for threatened and endangered species, but none were found. Bald eagles may occasionally be found during the winter along the major streams in this area, but no roosts, nests, or concentration areas have been documented.

### North Fork

#### Mandatory Wilderness Characteristics

##### Size

The North Fork WSA contains 10,089 acres, approximately twice the 5,000-acre minimum size requirement for wilderness areas. The WSA stands as an individual area—it is not dependent on other lands for size integrity.

There are no private inholdings within this WSA. Approximately 3,200 acres of state land adjoins the WSA.

##### Naturalness

Like the Gardner Mountain unit, the North Fork WSA is an excellent example of an area that appears to have been affected primarily by the forces of nature, with human influences substan-

tially unnoticeable. Much of the WSA contains the steep, forested terrain of three major canyons and a number of minor ones. Pass Creek and North Fork of the Powder River, both perennial, have formed canyons that vary in depth from 300 feet to 1,000 feet. Packsaddle Canyon has no perennial stream.

A large percentage of the WSA is covered by forested slopes of ponderosa pine interspersed with open areas.

Identifiable imprints are associated with range improvement projects such as reservoirs, fences, and associated vehicle routes.

#### Outstanding Opportunities

The BLM's inventory determined that the North Fork WSA offers opportunities for solitude because of the many canyons and forested lands in the area. It also offers opportunities for primitive recreation in hiking, backpacking, fishing, hunting, sightseeing, horseback riding, and rock climbing. Movement within the three canyons is restricted, for the most part, to canyon bottoms. Access points into the steep, rocky canyons are limited.

#### Special Features

The entire North Fork WSA provides critical winter range for elk. The Wyoming Game and Fish Department (WGFD) has rated the North Fork of the Powder River Class II (fishery of statewide importance) and Pass Creek Class III (fishery of regional importance).



Bald eagles and peregrine falcons, both endangered species, migrate through the area and can be found in the North Fork WSA.

### Multiple Resource Benefits

Wilderness designation would ensure benefits to watersheds, soil, vegetation, and wildlife habitat by preventing the impacts associated with mineral development and timber harvesting. Approximately 6,850 acres of forestland would be preserved if this area was designated wilderness.

### Diversity

Like Gardner Mountain, the North Fork WSA is representative of the Douglas-fir Forest ecosystem/Rocky Mountain Forest province. The distribution

of this type of ecosystem in the NWPS is discussed in the "Gardner Mountain" section.

The availability of primitive recreation opportunities in the area described in the discussion of Gardner Mountain WSA and shown on table AP 7-8 applies to the North Fork WSA as well, since the two WSAs are in the same area. The addition of either Gardner Mountain or North Fork to the NWPS would increase the concentration rather than balance the distribution of wilderness on a national or regional basis.

### Other Resource Values

#### Cultural Resources

Although no systematic cultural resource surveys have been conducted in the North Fork WSA, 21 sites have been recorded in the area. Five rock shelters and 17 lithic scatters are known to be within the unit; all of these localities are currently considered potentially eligible for the National Register of Historic Places.

On the basis of previous investigations, archeological sites in the North Fork WSA are expected to occur at the rate of approximately 5 to 10 per square mile on grassy open slopes. These sites will probably be small, open, limited activity areas, often with some primary or secondary quarrying. Canyon settings on lower slopes can be expected to have sharp increases in site densities. These consist chiefly of larger open camps and rock shelters.

#### Forest Resources

Approximately 2,900 acres of commercial forestland and 3,950 acres of woodland lie within the North Fork WSA. The 2,900 acres of commercial forestland contain approximately 18 MMBF of decadent sawtimber size old growth Douglas-fir and ponderosa pine. The potential full annual sustained yield harvest level of the commercial forestlands is estimated at 261 MBF. The total volume in the commercial forestland in the entire resource area, including forestlands administered by the Forest Service, is estimated at 1.5 billion board feet.

The 3,950 acres of woodland contains approximately 2.2 million cubic feet of limber pine and ponderosa pine wood fiber. The potential full annual sustained yield harvest level of the woodlands is estimated at 47,000 cubic feet.

There are no plans to harvest timber in the WSA before 1994.

## Wilderness

### Grazing Resources

Portions of two livestock grazing leases and an entire third lease lie within the North Fork WSA. An estimated 1,195 AUMs of livestock forage are available on the public lands within the WSA boundary, according to the MRB range survey, as follows:

Lease 7236 includes about 3,850 acres in the North Fork WSA, which provides about 310 AUMs for cattle. This public land is used in conjunction with approximately 8,420 acres of state lease and private lands and about 2,700 acres of BLM-managed land outside the wilderness boundary. The lessee is authorized to graze 1,200 yearling cattle on this allotment from April 1 to October 15.

Lease 7196 includes 4,700 acres of BLM land within the North Fork WSA, which produces approximately 565 AUMs for livestock. The WSA land is used in conjunction with approximately 12,000 acres of private and nonfederal lease land and 4,200 acres of BLM-managed land outside the WSA. The lessee is authorized to graze 620 cattle on this allotment from June 25 to October 10.

The mountain pasture portion of lease 7283 contains approximately 320 acres of public land entirely within the WSA, which provides an estimated 31 AUMs of forage for livestock. The BLM lease is used in conjunction with about 4,000 acres of private and state lease land. The lessee is authorized to graze 1,800 sheep and 50 cattle in the WSA from June 15 to October 31.

Approximately 1,200 acres of BLM-administered land along the canyon walls of the North Fork of Powder River are not leased for livestock grazing. These lands are considered unsuitable for livestock use because of steep slopes and low forage production.

Existing range improvements within the North Fork wilderness study area are listed in table AP 7-4 in the "Alternatives" section.

### Lands and Realty

The North Fork WSA, which lies at this south end of the Big Horn Mountains about 60 miles north-northwest of Casper, contains 10,089 acres of public land. There is no privately owned land within the boundaries of this WSA. However, the WSA is entirely surrounded by private land, and there is no public access into the area except by granted permission from landowners (see the Surface Ownership map).

### Mineral Resources

*Leasable Minerals.* Some potential exists for the occurrence of oil and gas beneath the eastern edge of the North Fork WSA. The presence of oil and gas can be determined only by detailed exploration, which may include drilling. Portions of two oil and gas leases extend into the WSA, covering approximately 150 acres. Additional information on the geology of the WSA is available in the North Fork mineral report of February 1982, which is on file at the Buffalo Resource Area office.

*Locatable Minerals.* No known or suspected deposits of locatable minerals in economic quantities are within the WSA. The potential for any energy or critical mineral resources within the North Fork WSA is considered extremely low. As of October 1, 1983, there were no mining claims within the WSA. Additional information may be found in the North Fork mineral report, which is available for review at the Buffalo Resource Area office.

### Recreation Resources

Recreation use in the North Fork WSA is dispersed except in the vicinity of the canyons, which receive some concentrated use. Like Gardner Mountain, the North Fork WSA provides a setting for semiprimitive motorized recreation activities. It is characterized by predominantly unmodified natural environment of moderate size. Because the WSA is surrounded by private land, use levels are low (fewer than 500 visitor days per year). Owners of adjacent property often charge an access fee, or in some cases deny access. Most recreation use is associated with motorized hunting, but fishing, horseback riding, camping, and sightseeing are also popular activities.

Because of the remoteness of the area, successful reproduction, and low public pressures, opportunities for fishing are excellent. As mentioned under "special features," streams in the WSA have been rated Class II and Class III by the WGFD.

The BLM has not initiated on-site management restrictions on visitor use, and no recreation facilities have been provided. Motorized travel is restricted to designated routes.

### Soil Resources

The soils in the North Fork WSA fall within three major categories.

## Wilderness

Loamy textured soils on gently sloping to moderately steep terrain predominate. These soils have dark surface layers due to accumulations of organic matter. Such soils support a shrub-herbaceous community and are a prime source of forage. Reclamation potential is good for these soils.

Also of major extent are very stony, shallow soils. These soils support a bunch grass community and have poor reclamation potential because of stoniness.

Timbered soils are found on moderately steep to steep northerly facing terrain in much of the WSA. These soils are typically moderately deep or deep, fertile, loamy soils with good reclamation potential.

Extremely steep escarpments of rock outcrop are found along the deeply incised major drainages. These landscapes accumulate very little or no soil because of the slope and the highly consolidated nature of the bedrock.



### Vegetation

The most widespread vegetation type in the North Fork WSA is a big sagebrush-dominated shrub community with an understory dominated by grasses. It is described in the discussion of vegetation for Gardner Mountain.

### Water Resources

The principal drainages of the North Fork WSA are the North Fork of Powder River and Pass

Creek, both of which flow perennially. Historical information is lacking, but water quality in these streams is considered good except during spring runoff, when sediment production is highest. Some water quality degradation occurs in the form of fecal pollution and increased sediment loads due to livestock grazing. The water resources discussion for Gardner Mountain describes sampling techniques performed during 1982 and 1983.

In summary, most of the samples show livestock-caused fecal pollution. None of the samples show dominant human sources, and

## Wilderness

virtually none of the streams sampled are considered fit for human consumption without treatment.

The average annual flow of the North Fork of Powder River below Pass Creek is 33.6 cfs, with a peak flow of 1,140 cfs. More detailed flow analysis on major streams within or near the WSA is available at the Buffalo Resource Area office.

The average annual rainfall in the WSA is estimated to be 16 inches.

### *Wildlife Resources*

The North Fork WSA contains the North Fork of Powder River and Pass Creek, which have been rated as Class II and III fisheries, respectively. The major species in these streams are rainbow, brown, and brook trout.

The North Fork of the Powder River and the many tributary drainages provide excellent escape cover and shelter for deer and elk.

The North Fork WSA has an estimated population of eight mule deer per section. Numbers fluctuate because the deer are mobile; however, it is known that about 250 to 350 mule deer summer in the general North Fork Area.

The entire North Fork WSA area, except for the North Fork and Pass Creek canyons and one section between Pass Creek and Pack saddle Canyon, is considered crucial winter and yearlong range for elk. Approximately 100 to 150 elk winter in this area, and about 100 head summer in the North Fork Area.

Antelope migrate to summer range north of the WSA along the Simmons Creek drainage. This drainage is an important migration corridor and crucial winter range for elk.

Black bears occasionally can be found in the North Fork WSA.

The U.S. Fish and Wildlife Service (USFWS) identified three golden eagle eyries and two prairie falcon eyries in the WSA in 1981.

The BLM inventoried the North Fork WSA in 1980 for threatened and endangered species, but none were found. Bald eagles may occasionally be found during the winter along the major streams of the unit, but no roosts, nests, or concentration areas have been documented.

## Fortification Creek

### **Mandatory Wilderness Characteristics**

#### **Size**

Fortification Creek WSA contains 12,419 acres, approximately 2½ times the 5,000-acre minimum size requirement. The WSA stands as an individual area not dependent on other lands for size integrity. There is one state section of approximately 640 acres within the WSA boundaries.

#### **Naturalness**

The Fortification Creek WSA appears to have been affected by forces of nature, with little evidence of human imprints. The topography of most of the area is rolling and dissected. Vegetation found in the unit is juniper, sage, and grass. Much of the natural character of the land has been maintained and preserved because of the area's ruggedness.

Identifiable imprints are associated with range improvement projects such as reservoirs, fences, and associated routes. Outside sights and sounds affect most of the WSA to a moderate degree. Impacts are associated with sounds from railroads and views of high voltage power lines, county roads, and adjacent oil development projects.

#### **Outstanding Opportunities**

Even though a person may see evidence of human imprints on adjacent lands, the rolling and dissected topography of the Fortification Creek WSA does provide some opportunities for solitude.

Fortification Creek offers very good opportunities for primitive and unconfined recreation. Some restriction of movement by natural barriers is present, but it would have little impact on those opportunities. The WSA does not have any reliable source of water.

#### **Special Features**

Approximately 75% of the WSA is considered crucial yearlong range for elk. In addition, the WSA provides important elk calving grounds.

Endangered species that may be found in the vicinity of the WSA are the bald eagle and the peregrine falcon. Both birds are possible winter migrants to the unit.

## Wilderness

### Multiple Resource Benefits

Wilderness designation would ensure benefits to soil and vegetation by preventing the impacts associated with mineral development.

### Diversity

Wilderness designation of this WSA would add a new ecosystem to the NWPS. The Sagebrush Steppe ecosystem/Great Plains Shortgrass Prairie province, in which the Fortification Creek area is classified, is not represented by any designated or administratively endorsed wilderness, and Fortification Creek is the only WSA with this ecosystem that is under study.

Table AP 7-10 summarizes the primitive recreation opportunities that are available within 250

miles of Billings, Montana, and Casper, Wyoming, the two population centers that are within one day's drive of the Fortification Creek WSA. The addition of this WSA to the NWPS would increase the concentration of wilderness in the Rocky Mountain region rather than balance the distribution on a national or regional basis.

### Other Resource Values

#### Cultural Resources

No cultural resource surveys or sites have been recorded for this WSA. It is anticipated that prehistoric site density is five per square mile. The sites are probably of medium size, on uplands and hilltops and around coniferous breaks. Sites might include tipi rings, hearths, and chipping stations of various functions.

TABLE AP 7-10  
SOLITUDE OR PRIMITIVE RECREATION OPPORTUNITIES  
NEAR POPULATION CENTERS  
WITHIN ONE DAY'S DRIVE FROM FORTIFICATION CREEK WSA

| Population Center | Designated Wilderness Areas |             | Areas Recommended for Designation |             | Areas under Study for Wilderness |             |
|-------------------|-----------------------------|-------------|-----------------------------------|-------------|----------------------------------|-------------|
|                   | Number of Areas             | Acreage     | Number of Areas                   | Acreage     | Number of Areas                  | Acreage     |
| Billings, MT      | 11                          | 3.5 million | 38                                | 7.3 million | 107                              | 2.2 million |
| Casper, WY        | 18                          | 4.0 million | 35                                | 3.6 million | 94                               | 1.6 million |

### Forest Resources

The Fortification Creek WSA contains approximately 1,000 acres of juniper woodland and no commercial forestland. The 1,000 acres of woodland contain approximately 100 MCF of wood fiber. The potential full annual sustained yield harvest land from the woodlands is estimated at 2 MCF.

### Grazing Resources

Portions of three livestock grazing leases lie within the Fortification Creek wilderness study area. The MRB range survey showed livestock forage production to be 1,350 AUMs. The grazing leases are as follows:

Lease 7253 includes approximately 380 acres of BLM-managed land in the WSA, which provides about 38 AUMs of grazing use during the fall and winter. This portion of the WSA is used in conjunction with approximately 4,000 acres of private land and 1,587 acres of public land outside the WSA boundary. Authorized use on this allotment is for 200 cattle from October 1 to March 31.

Lease 7171 includes approximately 5,837 acres within the WSA, which provides approximately 764 AUMs; this land is used in conjunction with approximately 15,000 acres of private land and about 5,400 acres of public land outside the WSA. Approximately 300 cattle graze in this allotment from October 1 to April 15.



Lease 7242 includes approximately 6,202 acres within the WSA, which produces 548 AUMs. The land within the WSA is used in conjunction with approximately 10,000 acres of private land and 6,000 acres of public land outside the WSA boundary. The lessee is authorized to graze 262 cattle in this allotment from November 1 to March 31.

Existing range improvements within the Fortification Creek wilderness study area are listed on table AP 7-6 in the "Alternatives" section.

### *Lands and Realty*

The Fortification Creek WSA lies in the Powder River Breaks area, roughly 35 miles northwest of Gillette. The unit contains 12,419 acres of public land and one state-owned section (640 acres). There is no privately owned land within its boundaries.

The WSA is surrounded for the most part by private land. Other parcels of public lands adjoin

the WSA on the south and west; however, there is no public access into the unit unless landowners grant permission (see the Surface Ownership map).

### *Mineral Resources*

**Leasable Minerals.** The WSA is considered to have high potential for the discovery of oil and gas deposits. Parts of three post-FLPMA oil and gas leases extend into the WSA, covering approximately 1,520 acres.

**Oil and gas exploration and development** are intensive on lands adjacent to the Fortification Creek WSA. The development includes roads, producing wells, pipelines, and developed sites.

An estimated 50 million tons of strippable coal with development potential lie beneath 960 acres of the WSA. The amount, less than 1/1000 of 1% of the known reserves of the Powder River Basin, is considered insignificant. Extremely large deposits of coal (several billion tons) lie beneath the entire

## Wilderness

WSA, but the coal is too deep for strip mining. The potential for strategic minerals deposits in this WSA is extremely low.

**Locatable Minerals.** No exploration for locatable minerals is known to have occurred, and no mining claims had been filed within the area as of October 1, 1983.

Additional information on minerals may be obtained in the Mineral Report for the Fortification Creek WSA, which is on file at the Buffalo Resource Area office.

### Recreation Resources

The Fortification Creek WSA provides a setting for semiprimitive motorized recreation and offers good opportunities for primitive and unconfined recreation. Current activities are motorized hunting, horseback riding, hiking, and camping.

There is no reliable source of potable water in this WSA. The current use level is low (fewer than 500 visitor days per year) largely because users must have the permission of owners of adjacent private land to gain access into the area.

Hunting within the WSA is considered excellent. The only big game species hunted is deer. Elk are present in the area, but no elk hunting is allowed at this time. A limited elk hunt, with 50 licenses, is tentatively planned for 1984.

### Soil Resources

The soils within the Fortification Creek WSA fall within two major categories primarily because of the slope of the landscape. The more fertile soils are on the flat to gently sloping areas, which make up about 55% of the WSA. These more stable surfaces have good accumulations of organic matter and good capacity for supplying moisture for plants.

On the moderately sloping to steep areas adjacent to the many minor drainages are soils that have a low permeability supporting a high level of water runoff. There is little organic matter in the surface, and sheet erosion is naturally high on these soils. They comprise about 40% of the area.

Soils on the remaining 5% of the area are recent alluvium found on flat areas. These soils have only moderate fertility, but they receive additional moisture from run-on, which enhances vegetative production. These soils typically have a tendency toward gully erosion.

The major soil factor limiting reclamation in this area is high clay content. The more fertile soil

type would be most subject to degradation by surface reclamation, during which the loamy surface layer, which contains most of the organic matter, could be mixed with the underlying layer, which is high in clay. The result would be a less permeable surface after reclamation. This could adversely affect the soil's moisture regime because of a higher runoff rate.

### Vegetation

The vegetation communities represented within the Fortification Creek WSA are typical of those found in the Powder River breaks. The productive potential of the vegetation communities is highly variable, which affects the concurrent variability of soils and slopes within the breaks landscape.

The most prominent vegetation community is a sagebrush-grassland complex. Big sagebrush is the most common shrub in this vegetation type, but silver sagebrush, snakeweed, and rabbitbrush are abundant on some sites. The understory vegetation is dominated by grasses and sedges, which account for 70 to 80% of the vegetative production of most sites. The most common understory plant species are western or thickspike wheatgrass, blue grama, needle-and-thread grass, bluebunch wheatgrass, threadleaf sedge, and prairie junegrass.

The land capability classification of an estimated 5 to 7% of the Fortification Creek WSA is Class VIII, according to the Soil Conservation Service (SCS). These lands have very steep slopes with shallow, easily erodible soils and excessive rock outcrop. The Class VIII lands support a woodland vegetation community dominated by ponderosa pine and Rocky Mountain juniper. The sparse understory vegetation in this community (5 to 20% ground cover) includes bluebunch wheatgrass, prairie clover, threadleaf sedge, fringed sage, and sandwort.

The contrast of the woodland vegetation and rocky outcrops of the Class VIII lands intermingled with the sagebrush/grassland vegetation presents an aesthetically pleasing and unique landscape.

### Water Resources

There are no perennial streams or rivers in the Fortification Creek WSA.

### Wildlife Resources

Since there are no permanent water sources in the Fortification Creek WSA, it contains no fisheries.



The WGFD estimates that the Fortification Creek WSA and adjacent lands are used by approximately 400 to 500 mule deer yearlong. The entire WSA is considered important winter and yearlong range for deer.

Approximately 100 to 150 elk range in the Fortification Creek WSA. About 75% of the area within this WSA is considered crucial yearlong range for elk. The WSA also provides important elk calving grounds.

The Fortification Creek elk herd is significant in that it is one of the last remaining herds to occupy a plains type habitat. In 1952-53, 35 elk were transplanted into the area to supplement a small existing herd.

One sharp-tailed grouse lek was found in the WSA and one lek was observed within  $\frac{1}{2}$  mile of the WSA in 1980. Sharp-tailed grouse is a state high-interest species.

The BLM inventoried the Fortification Creek WSA in 1981 for threatened and endangered species, but none were found. However, bald eagles may occasionally be found in the area during the winter.

## Environmental Consequences

### Alternative A: No Action

#### Alternative GM-A: Gardner Mountain, No Action

Under Alternative A, The Gardner Mountain WSA would not be designated wilderness. As a result, long-term protection of its wilderness values would not be ensured.

Oil and gas exploration and other surface-disturbing activities would be allowed over the long term. Impacts such as access roads, drilling pads, pipelines, and storage areas would be possible, and they would adversely affect the naturalness, solitude, and scenic values of this unit.

Forest management would have low priority, but timber resources would not be withdrawn. Small cash sales of woodland timber would create some surface and visual impacts. Motorized vehicle use would be restricted, but impacts on naturalness

## Wilderness

might not be eliminated. Although few grazing improvements would be planned, there are no guarantees that long-term development or vegetative manipulation would not occur.

Although long-term protection of visual resources, soil and water resources, wildlife habitat, and primitive forms of recreation would not be guaranteed, other management actions would protect these resources, at least over the short term. Not designating this area as wilderness would not have any significant effect on energy and minerals, range resources, or timber resources.

### Alternative NF-A: North Fork, No Action

The environmental consequences for the North Fork WSA under "no action" would be the same as those described for Gardner Mountain.

### Alternative FC-A: Fortification Creek, No Action

Under Alternative FC-A, long-term protection of the existing wilderness values would not be guaranteed. The diversity of the NWPS would be adversely affected in that the Sagebrush Steppe ecosystem/Great Plains Shortgrass Prairie province, as represented by the Fortification Creek unit, would not be added to the NWPS.

Because of the high potential for oil and gas, there is a potential for exploration and development activities over at least part of the area. Possible effects such as access roads, drill pads, pipelines, and storage areas could adversely affect the qualities of naturalness and solitude in the area. These impacts would be largely mitigated by the attachment of suitable stipulations to future leases. However, in all likelihood the present wilderness characteristics would be lost or seriously compromised in the short term. Mineral development would cause a significant decline in the quality and quantity of elk and mule deer habitat.

Forest management would have low priority, but approximately 1,000 acres of woodland would be available for the harvest of minor forest products such as fuelwood and posts. Small cash sales of forest products would create some surface and visual disturbance.

Effects from grazing would be slight since few improvements are proposed within the unit and little maintenance is needed on existing improvements. Motorized vehicle use would be restricted; this would reduce the possibility of disturbance. The sights and sounds associated with motor vehicles would impair the area's solitude.

### Alternative B (and C): No Wilderness

#### Alternative GM-B: Gardner Mountain, No Wilderness

Because of Gardner Mountain's small size and the abundant regional supply of wilderness opportunities, not designating this unit as wilderness would have little effect on providing needed wilderness opportunities close to major population centers or on expanding the geographical distribution of the NWPS. Although it is unlikely that any significant degradation would occur to the area's outstanding values over the short term (up to ten years), long-term protection would not be as secure as it would be with wilderness designation.

Restrictions on the use of motorized vehicles by grazing lessees and recreationists would not be as severe under this alternative as under Alternative D (all wilderness). However, use of motorized transportation by recreationists would be kept to a minimum with the introduction of hiking and horseback trails into the scenic portions of the area.

Approximately 750 acres of potentially commercial forestland and 980 acres of woodland would remain in the allowable timber harvest base of the resource area. However, no harvesting is expected to occur within the management unit until the late 1990s, and then harvest would be only on a "select" basis (small areas would be cut). Harvesting of this timber would create surface and visual impacts, causing some degradation to the existing wilderness values.

A total of 6,423 acres would remain open to mineral leasing and possible development, subject to stipulations. However, because of the low mineral potential within the area, mineral development would be unlikely to occur, especially during the short term.

Since the area would be available for both mineral development and timber harvesting, it is possible that big game would avoid roads and activity areas over the long term. This displacement could be expected to be minimal, and no significant population decreases would result. Stream sedimentation could be expected to increase slightly; however, fish populations would not be expected to decline.

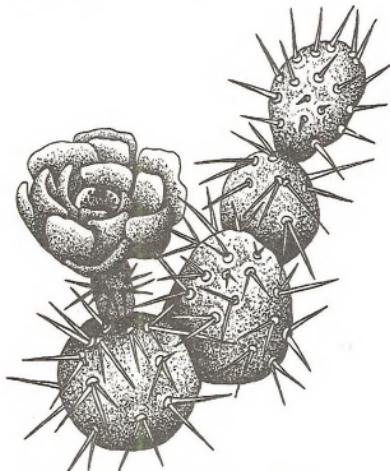
The development of public access to the Gardner Mountain WSA would open approximately 35,000 acres of public land for recreational use by the general public. There is a high prob-

## Wilderness

ability that this would occur because of the strong demand for access to public land in the resource area. The development of this access would have a beneficial effect on the availability of recreational opportunities.

If Congress accepted the recommendation not to designate the WSA as wilderness, the opportunity to experience primitive recreation in the resource area would be reduced insignificantly (estimated at less than 10%). This effect is considered highly probable because of the high demand for access to public lands and available hunting areas. Impacts in recreation would be moderate and long term.

This alternative would provide a lower level of protection of scenic qualities than would have been applied under wilderness management. Instead of a VRM Class I, the Gardner Mountain would be Class II. Consequently, there would be some small degradation of visual resources because of possible range improvements or small timber sales.



Alternative NF-B: North Fork, No Wilderness

The North Fork WSA, like Gardner Mountain, is relatively small. The abundant regional supply of wilderness opportunities means that nondesignation would have little effect on providing needed wilderness opportunities close to major population centers or on expanding the geographical distri-

bution of the NWPS. As in Gardner Mountain, it is unlikely that any significant degradation would occur to the area's outstanding values over the short term, but long-term protection would not be as secure as it would be with wilderness designation.

The discussion of the use of motorized vehicles in Gardner Mountain also applies to the North Fork unit.

Approximately 2,900 acres of potentially commercial forestland and 3,950 acres of woodland would remain in the allowable timber harvest base of the resource area if North Fork WSA was not designated wilderness. However, no harvesting would be expected to occur within the management unit until the late 1990s, and then harvesting would be done only on a "select" basis. The harvesting of this timber would create surface and visual impacts, causing degradation of the existing wilderness values.

A total of 10,089 acres within the WSA would remain open to mineral leasing and possible development, subject to appropriate stipulations. It is anticipated that some interest would be shown in leasing and development of oil and gas. Therefore, wilderness values probably would be degraded in the long term, but the attachment of site-specific stipulations would help to protect the area's scenic and wildlife values. Stream sedimentation would be expected to increase slightly, but fish populations would not be expected to decline.

The development of public access to the North Fork WSA would open approximately 16,000 acres of public land for recreational use by the general public. There is a high probability that this would occur because of the strong demand for access to public land in the resource area. The development of this access would have a beneficial effect on the availability of recreational opportunities.

If Congress accepted the recommendation not to designate the WSA as wilderness, the opportunity to experience primitive recreation in the resource area would be reduced insignificantly (estimated at less than 10%). This effect is considered highly probable because of the high demand for access to public lands and available hunting areas. Impacts on recreation would be moderate and long term.

This alternative would provide a lower level of protection of scenic qualities than would have been applied under wilderness management. Instead of a VRM Class I, the North Fork area

## Wilderness

would be Class II. Consequently, there would be some small degradation of visual resources in the North Fork area because of possible range improvements or small timber sales.

### Alternative FC-B: Fortification Creek, No Wilderness

The effects described for Alternative FC-A also would occur under Alternative FC-B.

Present protective stipulations applied to adjacent crucial elk wintering and calving areas and mule deer yearlong habitat would not be sufficient to prevent habitat and population losses through displacement, increased physiological stress during crucial periods, and loss of animals from poaching, vehicle traffic, and improved hunter access. Mitigative measures and protective seasonal restrictions would reduce the probability of such actions; however, the present "no surface occupancy" areas outside the WSA would be surrounded by oil and gas development, roads, and vehicle traffic after removal of the present leasing restrictions in the WSA.

This alternative would provide a lower level of protection of scenic qualities than would have been applied under wilderness management. Instead of a VRM Class I, the Fortification Creek WSA would be Class III. Visual impacts associated with oil and gas exploration and development would be highly probable. The impact would be long term but not irreversible or irretrievable.

### Alternative D: All Wilderness

#### Alternative GM-D: Gardner Mountain, All Wilderness

Designation of the Gardner Mountain area as wilderness would best preserve the existing wilderness values. This alternative would not add a new ecosystem to the NWPS or significantly expand wilderness opportunities near major population centers.

Visual resources, soil and water resources, and primitive recreation opportunities all would benefit from wilderness designation. Wildlife populations and habitat would be expected to remain in the present good condition, although a slight seasonal displacement of big game would occur because of wilderness users.

Opportunities for motorized recreation would be forgone with wilderness designation, and 750

acres of potentially commercial forestland and 980 acres of woodland would not be available for the limited harvest of forest products. Under wilderness designation, no mineral leasing or development would occur without congressional consent.

A recommendation to designate the WSA as wilderness would result in increased livestock management costs to three operators who hold grazing leases inside the WSA boundaries. The increased costs of operation would result from the exclusion of motor vehicle use for normal management operations such as fence maintenance and stock gathering.

Primitive recreation opportunities would be preserved on 6,423 acres if Congress accepted the recommendation to designate the WSA wilderness. Development of public access to the WSA also would provide access to other public lands. These other lands adjacent to the WSA or to the access route total approximately 35,000 acres. This impact is considered highly probable because of the high demand for access to public land and available hunting areas. These effects on recreation would be positive, moderate, and long term.

Wilderness designation of the WSA would afford the lands within the WSA the highest level of visual protection, Class I. This class provides primarily for natural ecological changes and some very limited management activity. Designation would result in a strong positive long-term effect on the visual resources. There is a very high probability that this effect would occur if Congress designated the area wilderness, because visual protection is included in wilderness policy.

#### Alternative NF-D: North Fork, All Wilderness

The environmental consequences for the North Fork WSA from wilderness designation would be the same as those described for Gardner Mountain (Alternative GM-D), except that potentially commercial forestland not available would be 2,900 acres, and woodland not available would be 3,950 acres.

A total of 10,089 acres would be preserved for primitive recreation. In addition, there would be legal access to 16,000 acres of land adjacent to the WSA.

#### Alternative FC-D: Fortification Creek, All Wilderness

Designation of the Fortification Creek WSA as wilderness would ensure long-term protection of

## Wilderness

existing wilderness values within the area. In addition, 12,419 acres of a unique ecosystem would be added to the NWPS.

The benefits of designation are not considered significant enough to offset the manageability problems. The configuration of the unit and its poorly identified boundaries could lead to inadvertant trespass. The open terrain and lack of physiographic features would increase the area's vulnerability to off-site intrusions and cross-country motorized travel. In addition, vehicle access to the state inholding would adversely affect the area's ability to provide primitive experiences.

Wilderness designation would adversely affect energy and mineral development because such activities would not be allowed without congressional consent.

A recommendation to designate the WSA as wilderness would result in increased livestock management costs to three operators who hold grazing leases inside the WSA boundaries. The increased costs of operation would result from

the exclusion of motor vehicle use for normal management operations such as fence maintenance and stock gathering.

Wilderness designation would result in a long-term benefit to wildlife and specifically to big game by providing 12,419 acres of basically undisturbed wildlife habitat. There is a high probability that this effect would occur.

Wilderness designation of the WSA would afford the lands within the WSA the highest level of visual protection, Class I. This class provides primarily for natural ecological changes and some very limited management activity. Designation would result in a strong positive long-term effect on the visual resources. There is a very high probability that this effect would occur if Congress designated the area wilderness, because visual protection is included in wilderness policy.

Opportunities for motorized recreation would be eliminated, as would the potential for limited harvest of forest products from 1,000 acres of woodland.



# MANAGEMENT UNDER WILDERNESS DESIGNATION

A wilderness study area that has been designated wilderness by Congress would be managed according to the BLM's *Wilderness Management Policy* (1981g). The full policy is on file at any BLM office. The following is a brief summary of the provisions of the policy.

## General Policy

BLM wilderness areas would be managed so as to preserve their wilderness character in a manner that would leave them unimpaired for future generations.

Some uses of wilderness, such as mining, grazing, and motorized travel, do not conform to the philosophy of wilderness but are specifically permitted by the Wilderness Act of 1964. These nonconforming but accepted uses would be managed in a manner that would prevent unnecessary and undue degradation of the area's wilderness character.

## Specific Policy Guidance

### Preservation of Wilderness Character

The BLM would foster a natural distribution of native flora and fauna. Fire, insects, and diseases would be allowed to play a natural role in the ecosystem except where those activities would endanger human life, property, or high value resources on adjacent nonwilderness lands.

### Use by Visitors

If use by visitors should threaten to impair the area's wilderness character, action would be taken to prevent impairment through direct or indirect methods. There could be instances where use by visitors would be curtailed or eliminated to protect the wilderness resource. Management would favor those types of uses that depend on a wilderness setting.

### Nonconforming Uses

#### Valid Existing Rights

Private rights that existed before the date an area was designated as wilderness would be recognized.

#### Aircraft and Motorboats

Use of aircraft and motorboats might be permitted to continue where such uses were established before designation.

#### Mining

Holders of unpatented mining claims that had been validly established before wilderness designation would be given the rights established by the U.S. mining laws. Holders of unpatented mining claims validly established after wilderness designation would be given similar rights subject to provisions of the Wilderness Act. All claimants must comply with reasonable conditions for protection of the wilderness resource.

Timber on mining claims in a designated wilderness area may be cut only for the actual development of the claim. All timber harvest would have to minimize adverse effects to the wilderness resource.

A bond may be required to ensure that all reasonable measures have been taken to reclaim disturbed lands as soon as possible after operations cease.

#### Withdrawals

Effective January 1, 1984, the minerals in designated wilderness areas were withdrawn from all forms of appropriation under the mining and mineral leasing laws, except for valid existing rights. All mineral activities in wilderness study areas are guided by the BLM's *Interim Management Policy* (1979a [rev. 1983]) until a wilderness determination can be made.

#### Access to Nonfederal Land

Owners of nonfederal land completely surrounded by wilderness must be given adequate access to their land. If that access would be detrimental to wilderness values, the BLM would attempt to acquire the inholding by purchase or exchange before granting access.

#### Existing Structures

Existing structures would be removed unless they have historical significance or are necessary for management of resources within the wilderness area.

## Wilderness

### Buffer Zones

No buffer zones would be created around wilderness areas to protect them from the influence of activities on adjacent lands.

### Grazing

Grazing of livestock would be permitted to continue if it had been established before wilderness designation and if it was in compliance with the wilderness management policy.

### Forestry

No commercial cutting of trees would be permitted. If campsite or cooking fires were permitted, fuelwood cutting would be limited to dead and down material.

### Guidelines for Specific Activities

#### Visitor Facilities

Facilities such as trails, bridges, signs, and campsites would be provided only when necessary for the protection of the wilderness resource. No improvements would be provided for the comfort or convenience of visitors.

#### Fish and Wildlife

Natural processes would be allowed to occur in wilderness ecosystems, including fish and wildlife populations, as much as possible without human influence. The preservation of sensitive, rare, threatened, and endangered species would be favored.

Hunting and fishing would be permitted subject to applicable state and federal laws and regulations. Commercial trapping would not be permitted.

#### Water Resources

Watershed restoration and water yield improvements are not generally in keeping with the wilderness objectives. Monitoring devices would be permitted if necessary for resource protection.

#### Air Quality

The BLM would manage designated wilderness areas under the present Class II air quality stan-

dards. This allows moderate deterioration associated with well-controlled industrial and population growth. (The state has the option of changing air quality classifications.)

#### Grazing

The Wilderness Act provides for the continuation of livestock grazing where it has been established prior to wilderness designation. This includes the activities and the facilities necessary to support a livestock grazing program. The major provisions of this policy are as follows:

There would be no curtailment of grazing simply because an area was designated wilderness. Any adjustments would be made as the result of normal grazing management plans.

The maintenance of support facilities is permissible in wilderness. Maintenance of facilities can be accomplished through the occasional use of motorized equipment where practical alternatives do not exist.

New improvements or facilities would be permissible if their primary purpose was protection rather than the accommodation of more livestock.

Facility replacement would not require the use of "natural materials" unless the use of such materials would not impose unreasonable additional costs.

#### Mining

A plan of operations must be submitted for all mining operations in wilderness areas. The provisions approved in the operating plan would protect the rights of the operator while minimizing the impacts on the wilderness resource. No unnecessary or undue degradation of the wilderness resource would be allowed.

Lands within wilderness areas were open to appropriation under the mining laws until December 31, 1983, to the same extent as prior to wilderness designation. Since January 1, 1984, development has been allowed to continue only on valid claims located before December 31, 1983.

On claims located since January 1, 1984, the following criteria must be satisfied before a plan of operation is approved:

## Wilderness

No unnecessary or undue degradation to public land resources would occur.

If the use of motorized equipment is proposed, there should be no other reasonable alternative.

The reclamation measures proposed must be adequate to provide for restoration of disturbed lands to an essentially natural state.

### Use of Motorized Equipment

Travel within wilderness areas is normally by nonmotorized, nonmechanical means. However, motorized equipment may be authorized in the following situations: public use of aircraft or powerboats where previously established, mining and prospecting, livestock grazing operations, emergency conditions involving visitor health and safety, fire suppression emergencies, official administration of the area, research and inventory, insect and disease control, and pursuit of fugitives.

Whether any of the above uses would be authorized in a given wilderness area would depend on the provisions in the management plan prepared for that area.

### Research

Research is an important use of the wilderness resource. Research would be permitted as long as it would be conducted in a manner that would preserve the wilderness character of the area. Research to evaluate the effectiveness of attaining wilderness management objectives would be supported.

### Cultural Resources

Study and restoration of significant cultural and historic sites may be permitted in individual cases where the project would not degrade the overall wilderness character of the area.



# APPENDIX 8: INDUSTRIAL DEVELOPMENT IN THE POWDER RIVER REGION

(projects included in baseline)

[NOTE: Asterisk indicates that project is in the Buffalo Resource Area; "(G)" indicates that all or part of the project is in the Thunder Basin National Grassland.]

## PRODUCING COAL MINES

Colstrip (Western Energy)  
Big Sky (Peabody)  
Absaloka (Westmoreland)  
Coal Creek  
Spring Creek (Nerco)  
Decker—East and West (Peter Kiewit)  
Big Horn (Peter Kiewit)\*  
North Rawhide (Carter)\*  
Eagle Butte (AMAX)\*  
Fort Union (Delzer Construction)\*  
Clovis Point (Kerr-McGee)\*  
Wyodak (Wyodak)\*  
Caballo (Carter)\*  
Belle Ayr (AMAX)\*  
Cordero (Cordero)\*  
Jacobs Ranch (Kerr-McGee)\*(G)  
Black Thunder (Anaconda)\*(G)  
Dave Johnston (Glenrock Coal)  
Buckskin (Shell)\*  
Coal Creek (Anaconda)\*

## NONPRODUCING COAL MINES

Montco-Nance (Montco)  
CX Ranch (Consolidation-Chevron)  
Ash Creek (Ash Creek Mining)\*  
Black Mountain (Black Mountain)\*  
Dutchman (JMT)\*  
Wildcat Creek (Gulf)\*  
Dry Fork (Phillips)\*  
South Rawhide (Carter)\*  
East Gillette (Kerr-McGee)\*  
Peabody (Peabody)\*  
Caballo Rojo (Mobil)\*  
Wymo Fuels (Wymo)\*  
North Rochelle (Shell Oil)\*(G)  
Rochelle (Peabody)\*(G)  
Antelope (NERCO)  
Coal Creek (Wesco Resources)  
Cook Mountain (Thermal Energy)  
Rocky Butte (Texas Energy)\*  
Keeline (Neil Butte)\*  
Crow-Shell (Shell)  
North Antelope (North Antelope Coal Company)\*(G)

## COAL DEVELOPMENT THAT COULD RESULT FROM THE ROUND II POWDER RIVER COAL SALE

Thundercloud\*(G)  
Timber Creek\*  
Kintz Creek\*  
Porcupine\*(G)  
Mount Logan\*  
Youngs Creek\*  
Donkey Creek\*  
Hidden Water\*  
Calf Creek\*  
Hay Creek\*  
Ridgerunner\*(G)

### Maintenance Tracts

Ashland (Decker-Birney)  
Mud Springs  
Northwest Otter Creek  
Hanging Woman  
Downey Coulee

## PREFERENCE RIGHT LEASE APPLICATIONS

Ulm Project (Fred C. Woodson)—2 PRLAs\*  
Wildcat Creek Area (Gulf)—7 PRLAs\*  
Thunderbird Project (Western Fuels)—16 PRLAs\*  
Thunderbird II (Wold-Jenkins)—11 PRLAs\*  
South Gillette (Peabody)—6 PRLAs (6 PRLAs  
were rejected and are under appeal)\*  
Belle Fourche (John Wold)—1 PRLA (1 PRLA  
was rejected and is under appeal)\*  
East Black Thunder (Anaconda)—3 PRLAs\*(G)  
Rochelle Area (Peabody)—5 PRLAs\*(G)  
North Antelope (NERCO)—2 PRLAs\*(G)  
South Antelope (Peabody)—1 PRLA  
Dull Center (Peabody)—2 PRLAs  
Sand Draw (Peabody)—5 PRLAs  
Stevens North (Western Fuels)—3 PRLAs  
Stevens South (Western Fuels)—1 PRLA  
Southern Powder River (CDT)—2 PRLAs

## Industrial Development

### COAL EXCHANGES

Big Horn\*  
Gulf\*  
Belco\*  
Kerr-McGee\*  
Whitney Benefits\*  
Peabody Coal  
Consolidation Coal

PINTEC and Thunderbird joint in situ\*  
Reno Road in situ  
Charlie Ore Body Mine and Mill\*  
Moore Ranch Mine\*  
Sand Rock Mill\*  
Bear Creek Mine and Mill  
Open Pit and Section 34 Mines  
Teton Exploration in situ  
SPRB Mill  
Highland Mine and Mill  
Nine Mile Lake in situ  
Morton Ranch Mine and Mill  
Bill Smith Mine

### POWER PLANTS

Colstrip 1  
Colstrip 2  
Neil Simpson\*  
Wyodak\*  
Osage  
Dave Johnston  
Colstrip 3 (P)  
Colstrip 4 (P)  
Missouri Basin Project

### BENTONITE MINE AND MILL AREA

American Colloid Mine and Mill  
NL-Industries Mine and Mill  
International Mineral Co. Mine and Mill  
Federal Bentonite Corp. Colony Mine and Mill  
American Colloid Mine  
Federal Bentonite Division Mine  
Benton Clay Corp. Mine  
Kaycee Bentonite Corp. Mine  
Benton Clay Corp. Mill\*  
Kaycee Bentonite Corp. Mill\*

### REFINERIES

Osage  
Wyoming  
Texaco  
Little America  
Glenrock  
Amoco

### OIL AND GAS

Regional Developments

### URANIUM MINE AND MILL AREA

Irigary in situ\*  
Greasewood Creek Mine\*  
North Butte Mine and Mill\*

### RELATED ENERGY DEVELOPMENT

ETSI Coal Slurry Pipeline\*  
Tongue River Railroad  
Chicago and North Western Railroad Connector\*

|                         |     |
|-------------------------|-----|
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# Glossary/References



# GLOSSARY

**ACRE-FOOT.** A term used in measuring the volume of water. An acre-foot is the amount of water required to cover 1 acre to a depth of 1 foot, or 43,560 cubic feet (325,851 gallons).

**ACTIVITY PLANNING.** Site-specific planning that precedes development. This is the most detailed level of BLM planning. An activity plan details management of one or more resources on a specific site. Examples are allotment management plans and recreation area management plans. Activity plans implement decisions made in the RMP.

**ACTUAL USE.** The number of livestock actually grazing on a given allotment. The use made of forage by livestock or wildlife without reference to permitted or recommended use.

**ALLOCATION.** The division of limited resources capabilities or supplies among the competitors for use.

**ALLOTMENT.** An area allocated for the use of the livestock of one or more qualified grazing lessees. It generally consists of BLM-managed lands but may include parcels of private or state-owned lands. The number and kind of livestock and period of use are stipulated for each allotment. An allotment may consist of several pastures or may be only one pasture.

**ALLOTMENT DEVELOPMENT PLAN.** A document that identifies allotment objectives and all range improvement projects necessary to achieve those objectives. It includes a brief analysis of the relationship of a proposed project to future projects and management actions. The purpose of an allotment development plan is to ensure that construction of a given project would not constrain future allotment management opportunities.

**ALLOTMENT MANAGEMENT PLAN.** A concisely written program of livestock grazing management, including supportive measures, if required, designed to attain specific management goals in a grazing allotment. An AMP is prepared in consultation with the permittee(s), lessee(s), and other affected interests. Livestock grazing is considered in relation to other uses of the range and in relation to renewable resources such as watershed, vegetation, and wildlife. An AMP establishes seasons of use, the number of livestock to be permitted, the range improvements needed, and the grazing system.

**ALLOWABLE CUT.** The amount of timber that may be harvested annually or periodically from a specified area over a stated period, in accordance with the objectives of management. It includes all planned timber and fuelwood harvest volumes except such products as Christmas trees, branches, and cones. Also called "allowable harvest."

**ALLUVIUM.** Unconsolidated rock or soil material such as gravel, sand, silt, or clay, that has been deposited by running water.

**ANIMAL UNIT.** A standardized unit of measurement for range livestock or wildlife. Generally, one mature (1,000-pound) cow or its equivalent, based on an average daily forage consumption of 26 pounds of dry matter per day.

**ANIMAL UNIT MONTH.** A standardized unit of measurement of the amount of forage necessary for the sustenance of one animal unit for one month; also, a unit of measurement that represents the privilege of grazing one animal unit for one month.

**ANION.** A negatively charged ion such as carbonate, bicarbonate, sulfate, or chloride. Also see Cation.

**AQUIFER.** An underground body of rock, sand, or gravel that is saturated with and conducts groundwater, a water-bearing formation that yields water to wells or springs.

**AREA OF CRITICAL ENVIRONMENTAL CONCERN.** An area within the public lands designated for special management attention to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards.

**"BLOCKED" LANDS.** Public lands in units of manageable size, as opposed to those in which the ownership pattern is "scattered" or "checkerboarded" between federal ownership and other ownership.

**"BLOCKING UP" LANDS.** Consolidating public land into units of manageable size through sale of scattered tracts or exchange of isolated tracts for land adjacent to other BLM-managed parcels.

**BOARD FOOT.** A unit of solid wood 1 foot square and 1 inch thick.

**BROWSE.** The tender shoots, twigs, and leaves of trees and shrubs often used as food by deer, antelope, livestock, and other animals; to feed on browse.

**CARRYING CAPACITY.** The maximum population of persons or animals that a given area can support without undergoing deterioration of vegetation or related resources. Carrying capacity of a given area may vary from year to year because of fluctuating forage production, which is primarily due to differing amounts of precipitation.

**CASUAL USE.** Activities ordinarily resulting in only negligible disturbance of the federal lands and resources; for example, activities that do not involve the use of mechanized earthmoving equipment or explosives or, in areas designated as closed to ORVs, do not involve the use of motorized vehicles.

**"CAT" LINE.** A strip cleared by a bulldozer during firefighting to form a break where there is no combustible material.

**CATION.** A positively charged ion such as calcium, magnesium, potassium, or sodium. Also see Anion.

**CLIMAX PLANT COMMUNITY.** The final vegetative community that emerges after a series of successive vegetational stages, representing the highest ecological development of a plant community capable of perpetuation under the prevailing climate and soil conditions.

**"CLOSED" DESIGNATION.** See *Off-road Vehicle Designations*.

**COMMERCIAL FORESTLAND.** Forestland that is now producing or capable of producing at least 20 cubic feet of wood fiber per acre per year from commercial coniferous tree species, and which has met certain economic, environmental, or multiple use criteria for inclusion in the commercial forestland base.

**COMMERCIAL THINNING.** Removal of merchantable surplus trees before they have reached sawtimber size. Trees removed will be sold for such uses as posts and poles. Removal of these trees improves growing conditions so that the remaining stand can achieve optimum growth. Also see *Precommercial Thinning*.

**COMPETITIVE BIDDING.** Bidding at an open public auction by qualified purchasers.

**CONTINUOUS FUELS.** In fire management, combustible material covering an entire area, with few patches of bare ground. Fires are more likely to spread rapidly in areas with continuous fuels.

## Glossary

**CORRIDOR.** A linear strip of land that forms a passageway between two points, in which transportation or utility systems may be located.

**COVER.** Vegetation or terrain used by wildlife for protection from predators and adverse weather conditions. Cover is a major component of wildlife habitat.

**CRITICAL WILDLIFE HABITAT.** The portion of the living area of a wildlife species that is essential to the survival and perpetuation of the species either as individuals or as a population. Loss of critical habitat would appreciably decrease the likelihood of the survival and recovery of a threatened or endangered species or a distinct segment of its population. Critical habitat may represent any portion of the present habitat of a listed species and may include additional areas for reasonable population expansion. Critical habitat must be officially designated as such by the USFWS or the National Marine Fisheries Service.

**CRUCIAL HABITAT.** Habitat on which a species depends for survival because there are no alternative ranges or habitats available. May also be called "key range" or "key habitat."

**CRUCIAL WINTER RANGE.** The portion of the winter range to which a wildlife species is confined during periods of heaviest snow cover.

**CULTURAL RESOURCES.** Any fragile and nonrenewable remnant of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, or natural features.

**CULTURAL RESOURCE INVENTORY.** A descriptive listing and documentation, including photographs and maps, of cultural resources. Processes involved are locating, identifying and recording of sites, structures, buildings, objects, and districts through library and archival research; collecting information from persons knowledgeable about cultural resources; and conducting on-the-ground field surveys of varying levels of intensity. Also see *Cultural Resource Inventory Classes*.

**CULTURAL RESOURCE INVENTORY CLASSES.** A Class I inventory of a defined area provides a narrative overview derived from existing information and a compilation of existing data on which to base the development of the BLM's site record system. A Class II inventory is a sample-oriented field inventory designed to locate and record, from surface and exposed profile indications, all cultural resource sites within a portion of a defined area to make possible an objective estimate of the nature and distribution of cultural resources in the entire defined area. A Class III inventory is an intensive field inventory designed to locate and record all cultural resource sites within a specified area. Upon completion of such an inventory, no further cultural resource inventory work is normally needed in that area.

**CULTURAL RESOURCE MANAGEMENT PLAN.** A plan designed to inventory, evaluate, protect, preserve, or make beneficial use of cultural resources and the natural resources that figured significantly in cultural systems. The objectives of such plans are the conservation, preservation, and protection of cultural values and the scientific study of those values.

**CULTURAL RESOURCE SITE** (cultural property). A physical location of past human activities or events. Cultural properties are extremely variable in size, ranging from the location of a single cultural resource feature to a cluster of cultural resource structures with associated objects

and features. Prehistoric and historic sites that are recorded as cultural resources have sociocultural or scientific values and meet the general criterion of being more than 50 years old.

**DECIBELS.** The most commonly used measure of sound, the decibel (dB) is a logarithmic function; that is, decibels are not directly additive. A small change in decibels would be a major change in noise intensity. For example, a sound level of 64 dB is twice as intense as a level of 60 dB. The "A" scale of weighing decibels most closely approximates human hearing; therefore, decibels on the "A" scale dB(A) are used to indicate sound levels. The distance from the sound source is a major determinant in the perception of sounds. Noise drops off 6 dB(A) for every doubling of distance from the source.

**DEPENDENCY.** The amount of an operation's forage that is provided by public lands, expressed as a percentage of a herd's total forage requirements for one year. The forage requirement is based on the operation's total herd.

**DIRECT SALE.** A sale of lands or minerals at fair market value to a designated purchaser without competitive bidding.

**DISPOSAL.** Transfer of ownership of a tract of public land from the United States to another party through sale, exchange, or transfer under the Recreation and Public Purposes Act.

**DISPOSAL AREA.** An area where public land generally will be made available for sale or exchange. Some land in a disposal area may be retained in public ownership, depending on site-specific application of the land ownership adjustment criteria.

**EASEMENT.** A right afforded a person or agency to make limited use of another's real property for access or other purposes.

**ECOSYSTEM.** A biological community together with its nonliving environment, forming an interacting system inhabiting an identifiable space.

**EDGE EFFECT.** Condition at the edge of a timber cut, where wildlife benefit from increased forage in the cleared area, cover in the area that remains forested, and a blend of types of vegetation at the edge of the cut.

**ENDANGERED SPECIES.** Any plant or animal species that is in danger of extinction throughout all or a significant portion of its range, as defined by the U.S. Fish and Wildlife Service under the authority of the Endangered Species Act of 1973.

**ENVIRONMENTAL ASSESSMENT.** A record of the environmental factors involved in a land management action.

**ENVIRONMENTAL IMPACT STATEMENT.** A written analysis of the impacts of a proposed project and alternatives.

**EPHEMERAL STREAM.** A stream that flows for only a short time each year in direct response to precipitation events.

**EROSION CONDITION CLASS.** A classification system for ranking soil erosion in increments of 20 points: 0 to 20 = stable; 21 to 40 = slight; 41 to 60 = moderate; 61 to 80 = critical; and 81 to 100 = severe.

**ESSENTIAL HABITAT.** Habitat of any threatened or endangered species that possesses the same characteristics as "critical habitat" but has not been officially designated "critical."

**FEATHERING.** An effect achieved at the edge of timber cuts by thinning part of the trees to avoid a straight line of demarcation between clearcut and forested areas. The

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**"feathered"** area provides a transition from cleared area through moderately forested to heavily forested areas.

**FEDERAL LANDS.** As used in this document, lands owned by the United States, without reference to how the lands were acquired or what federal agency administers the lands. The term includes mineral estates or coal estates underlying private surface but excludes lands held by the United States in trust for Indians, Aleuts, or Eskimos. Also see *Public Land*.

**FIRE MANAGEMENT.** The integration of knowledge of fire protection, prescribed fire, and fire ecology into multiple use planning, decision making, and land management activities. Fire management places fire in perspective with overall land management objectives.

**FLOODPLAIN.** The nearly level alluvial plain that borders a stream and is subject to inundation during high water.

**FORAGE.** Vegetation of all forms available for animal consumption.

**FORAGE CONDITION.** The proportion of preferred, desirable, and undesirable plant species present in a given location. The designations are based on palatability or on the forage preference displayed by a specific livestock or wildlife species.

**FORAGE UTILIZATION.** The proportion of vegetation or foliage removed from a plant by grazing or browsing animals. Usually expressed as a percentage of the plant's total annual weight.

**FOREST DEVELOPMENT.** A program of silvicultural treatment to perpetuate and improve production of wood and related values. It includes such treatments as site preparation, seeding, planting, and protective measures.

**FORESTLAND.** Land that is now, or is capable of becoming, at least 10% stocked with forest trees of any size; or land that formerly had such tree cover but is not currently developed for nonforest uses.

**FULL SUPPRESSION.** The aggressive and complete suppression of all wildfires, regardless of cause.

**GRAZING DECISION.** A decision reached through planning and consultation. Grazing decisions may include adjustments in livestock grazing, development of management plans, and implementation of range improvement projects as needed to meet multiple-use management objectives.

**GRAZING LEASE.** A document authorizing the grazing of a specified number and kind of livestock on a designated area of BLM-managed public land for a specified period.

**GRAZING PREFERENCE.** The total number of AUMs on public land apportioned and attached to base property owned or controlled by a lessee.

**GRAZING SYSTEM.** A systematic sequence of grazing use and nonuse of an allotment to reach identified multiple use goals or objectives. The following are some types of grazing systems:

**Rest-Rotation:** Grazing is deferred on various parts of an allotment during succeeding years, and the deferred parts are allowed complete rest for one year or more. The allotment is divided into pastures, and each pasture is systematically grazed and rested so that livestock production and other resource values are provided for, while the vegetation cover is simultaneously maintained or improved.

**Deferred Rotation:** Grazing is discontinued on different parts of an allotment in succeeding years so that each pasture can rest successively during the growing season to permit seed production, establishment of seedlings, and restoration of plant vigor. No yearlong rest is provided.

**Deferred Grazing:** Grazing is discontinued on an area for a specified period until after key plants have reached an advanced stage of development. The growing season rest provided by this system promotes plant reproduction, establishment of new plants, or restoration of the vigor of old plants.

**Alternate Grazing:** Grazing and resting of a pasture in alternate seasons. This system is based on the assumption that animals in large numbers make more uniform use of the forage and that a rest from grazing is beneficial to the plant, even though it must support a greater number of animals in the shorter time during which it is grazed.

**Short-Duration, High Intensity Grazing:** Short-duration grazing with the stocking rate higher than normal. The purpose of this system is to obtain uniform use of desirable and undesirable plants and to prevent regrazing on regrowth of the most desirable plants.

**GROUNDWATER.** The part of subsurface water that completely saturates the rocks and is under hydrostatic pressure.

**HABITAT CONDITION.** The condition of seasonal habitat as it relates to the needs of a particular big game species. Condition is determined by such factors as browse vigor rating, forage quality, cover factors, human interference, water distribution, and vegetation quality. Components are evaluated independently. Habitat condition is somewhat related to, but is not the same as, existing or potential range condition.

**HABITAT MANAGEMENT PLAN.** An officially approved activity plan for a specific geographic area of public land. An HMP identifies wildlife habitat and related objectives, defines the sequence of actions to be implemented to achieve the objectives, and outlines procedures for evaluating accomplishments.

**HIGH TO MODERATE COAL RESERVES.** As formerly used in coal planning, coal reserves with stripping ratios no greater than 5 to 1 (the stripping ratio is 5 cubic yards of overburden per ton of coal) and an overburden depth of not more than 250 feet. Coal planning formerly was based on coal reserves meeting the above definition of having high to moderate potential for development. Current coal planning considers areas with potential for coal development without these limits.

**I-90 COAL EXCHANGES.** Public Law 95-554 of 1978, which amended the Minerals Leasing Act of 1920, authorized the Secretary of the Interior to carry out exchanges with owners of specific coal leases that are crossed by Interstate Highway 90. The BLM, acting for the Secretary of the Interior, can exchange other federal coal for the coal in those leases that could not be mined because of the highway.

**INTENSIVE MANAGEMENT (grazing).** Management using range improvements and scientific techniques, including grazing systems, to maximize sustained yields of animals and forage production.

**INTENSIVE TIMBER MANAGEMENT.** The practice of converting an unregulated forest into a maintained and managed forest that will approach the desired or optimum level of growing stock as rapidly as possible. This is achieved by such practices as precommercial and commercial thinning, large-scale site preparation, planting,

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**brush and hardwood control, fertilization, and forest genetic improvements.**

**ION.** Negatively or positively charged particle in solution in water.

**KEY SPECIES.** Generally two to four of the most important forage plants in a range area. They usually furnish a good portion of the bulk of the forage on that range area, and their being used to capacity indicates that the entire range area is being used correctly.

**KNOWN GEOLOGIC STRUCTURE.** An area known to contain producible oil and gas deposits. A trap in which an accumulation of oil and gas has been discovered by drilling and which has been determined to be productive. The limits of a KGS comprise all acreage that is presumptively productive. If lands are underlain by a KGS, they may be leased only through a competitive system.

**LAND TREATMENT.** All methods of artificial range improvement and soil stabilization, including reseeding, chemical and mechanical brush control, pitting, furrowing, and water spreading.

**LEASABLE MINERALS.** Minerals subject to lease by the federal government, such as coal, oil and gas, oil shale, potash, sodium, phosphate and other minerals that may be acquired under the Mineral Leasing Act of 1920, as amended. The major leasable minerals in the Buffalo Resource Area are oil and gas and coal.

**LEGAL DESCRIPTION.** The description of a particular parcel of land according to the official plat of its cadastral survey. Legal descriptions of lands involved in BLM actions generally specify township and range numbers, followed by section number and then portion of the section; for example, T49N, R75W, Sec. 6, S½NE4.

**LEK.** A site used by grouse for courtship display. Also called "strutting ground" or "dancing ground." The lek is the center point of the annual reproduction cycle. Most nesting occurs within 2 miles of the lek.

**LICENSED USE.** Active use AUMs that a grazing lessee has paid for during a given grazing period.

**"LIMITED" DESIGNATION.** See *Off-road Vehicle Designations*.

**LIMITED SUPPRESSION.** A deviation from normal fire suppression procedures based on a land use decision or practiced where controlling fires is extremely difficult or dangerous, or where the values at risk do not warrant the expense associated with normal suppression. Limited suppression is not a let-burn policy. All fire starts and reports receive some action. In limited suppression areas the action may be monitoring fires under prescribed meteorological conditions in areas of sparse vegetation, low historical fire occurrence, or low resource value; extended initial attack times; deployment of fewer personnel or less equipment; or restrictions on certain firefighting equipment. All fires that threaten human life, structures, range improvements, or livestock are immediately suppressed, as are those burning outside prescribed weather factors. The goals in limited suppression are to provide fire protection commensurate with the values of the resources and to provide for the safety of fire personnel.

**LINEAR RIGHT-OF-WAY.** An authorization for the use of land for a specified purpose that requires a long, narrow strip of land. Examples are roads, power lines, and pipelines.

**LIVESTOCK OPERATION.** The management of a ranch or farm so that a significant portion of the income is derived from the continuing production of livestock.

**LOCATABLE MINERALS.** Generally, the metallic minerals subject to development specified in the Federal Mining Law of 1872. Examples are gold, silver, and copper.

**MANAGEMENT FRAMEWORK PLAN.** A BLM planning decision document that establishes, for a given planning area, land use allocations, coordination guidelines for multiple use, and management objectives to be achieved for each class of land use or protection. This type of land use plan is being replaced by the resource management plan.

**MITIGATION.** A method or process by which impacts from actions may become less injurious to the environment through appropriate protective measures.

**MONITORING.** Specific studies that evaluate the effectiveness of actions taken toward achieving management objectives.

**MULTIPLE USE.** Coordinated management of various surface and subsurface resources so that they are used in the combination that will best meet present and future needs.

**NATIONAL REGISTER OF HISTORIC PLACES.** The official list, established by the Historic Preservation Act of 1966, of the nation's cultural resources worthy of preservation.

**NONCOMMERCIAL FORESTLAND.** Land that is not capable of yielding at least 20 cubic feet of wood per acre per year of commercial species; also, land that is capable of producing only noncommercial tree species.

**NORMAL FIRE YEAR PLAN.** A planning process that sets limits on personnel, aircraft, ground tankers, and warehouse levels for fire suppression, as well as the funding level for presuppression during the activation period, generally May 1 to September 30.

**OFF-ROAD VEHICLE.** Any motorized tracked or wheeled vehicle designed for cross-country travel over any type of natural terrain. Exclusions (from Executive Order 11644, as amended by Executive Order 11989) are nonamphibious registered motorboats, any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes, any vehicle whose use is expressly authorized by the authorizing officer or otherwise officially approved, vehicles in official use, and any combat support vehicle in times of national defense emergencies.

**OFF-ROAD VEHICLE DESIGNATIONS.** BLM designations for ORV operation are as follows:

- Open areas** are designated areas and trails where ORVs may be operated subject to operating regulations and vehicle standards set forth in the *BLM Manual*, sections 8341 and 8343.
- Limited areas** are designated areas and trails where the use of ORVs is subject to restrictions such as limits on the number or types of vehicles allowed, dates and times of use, limit of use to existing roads and trails, or limit of use to designated roads and trails. When ORVs are limited to designated roads and trails, use is allowed only on roads and trails that are signed for use. Combinations of restrictions are possible.
- Closed areas** are designated areas and trails where the use of ORVs is permanently or temporarily prohibited. Emergency use of vehicles is allowed.

**"OPEN" DESIGNATIONS.** See *Off-road Vehicle Designations*.

**OVERMATURE.** The period in the life cycle of stands of trees when growth is declining.

**PARTURITION.** Giving birth to offspring.

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**PASTURE.** As used in this document, a subdivision of a grazing allotment.

**PATENTED CLAIM.** A mining claim on which title has passed from the federal government to the claimant under the 1872 Mining Law.

**PERENNIAL STREAM.** A stream that flows throughout the year.

**PLANNING CRITERIA.** The factors used to guide development of a resource management plan or revision. They ensure that a plan or revision is tailored to the issue previously identified and that unnecessary data collection and analysis are avoided. Planning criteria guide the collection and use of inventory data, the analysis of the management situation, the formulation of alternatives, the estimates of the effects of alternatives, the evaluation of alternatives, and the selected of the preferred alternative.

**PRECOMMERCIAL THINNING.** Removal of surplus trees before they have reached merchantable size, to achieve correct spacing and better growing conditions for the remaining trees. Also see *Commercial Thinning*.

**PREFERENCE.** Grazing privileges established following the passage of the Taylor Grazing Act, based on the use of the federal range during the priority period. The active preference and suspended preference together make up the total grazing preference.

**PREFERENCE RIGHT LEASE APPLICATION.** An application for a noncompetitive coal lease. Under the Mineral Leasing Act of 1920, the Secretary of the Interior was authorized to issue exploration permits for land where the existence or workability of coal resources was unknown. A permittee who could demonstrate, during the term of the permit, the existence of commercial quantities of coal was entitled to a "preference right lease"; that is, a noncompetitive lease. Provisions for prospecting permits were repealed in 1976, but current federal coal regulations (943 CFR 3430) provide for processing of pending PRLAs.

**PRESCRIBED FIRE.** The application of fire in a controlled manner to a specified area under specific weather conditions (a prescription) to achieve predetermined resource management objectives; the use of fire as a resource management tool.

**PRIMITIVE RECREATION OPPORTUNITY.** Opportunity for isolation from the sights and sounds of human beings. Opportunity to feel a part of the natural environment and use outdoor skills.

**PRODUCTIVE FORESTLAND.** Forestland capable of yielding at least 20 cubic feet of wood per acre per year from any tree species.

**PUBLIC LAND.** As used in this document, surface or mineral estate administered by the Bureau of Land Management. Also see *Federal Lands*.

**RANCH UNIT ANALYSIS.** A documented review of the history of the grazing management and use of public land leased for grazing and associated deeded land, which together form the ranch unit. The analysis involves consultation with the ranch operator to determine the normal season of use and number and kind of livestock for each pasture in the lease. The location and condition of existing range improvements are documented, and management opportunities and resource problems are noted.

**RANGE CONDITION.** The present state of the vegetation of a range site in relation to the climax plant community for that site. Range condition is expressed as excellent, good, fair, or poor. Also called ecological range condition.

**RANGE IMPROVEMENT.** Any activity or program on or relating to rangelands designed to improve production of forage, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, or provide habitat for livestock, wild and free-roaming horses and burros, or wildlife. Range improvement projects may be fences, reservoirs, brush control, or spring and well developments.

**RANGE SITE.** A distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community.

**RANGE TREND.** The change in vegetation and soil characteristics resulting from environmental factors, primarily climate and grazing. Studies of range trend are used in combination with other studies to evaluate grazing systems.

**RANGELAND MONITORING PROGRAM.** A program designed to measure changes in plant composition, ground cover, animal populations, and climatic conditions on the public rangeland. Studies monitor changes in range condition and determine the reason for any changes. Studies monitor actual use, forage utilization, trend, and climatic conditions.

**RECREATION MANAGEMENT AREA.** A subunit of a resource area that constitutes a basic land unit of recreation management. Each area is identified and managed as a unit on the basis of similar or interdependent recreation values; homogeneous or interrelated recreation uses, land tenure, and use patterns; or administrative efficiency. There are two types of recreation management areas, extensive and special.

**Extensive recreation management areas** are areas where dispersed recreation is encouraged and where visitors have freedom of recreational choice with minimal regulatory constraint. Significant recreation issues or management concerns are limited, and minimal management suffices. Detailed planning is not usually required.

**Special recreation management areas** are areas where congressionally recognized recreation values exist or where significant public recreation issues or management concerns occur. Special or more intensive types of management are typically needed, detailed recreation planning is required, and more facilities and supervision are likely.

**RECREATION AND PUBLIC PURPOSES.** R&PP refers to both the Recreation and Public Purposes Act ([43 USC 869(a)]) and the uses to be made of public land transferred under the act. The objective of the R&PP Act is to meet the needs of state and local government agencies and non-profit organizations by leasing or conveying public land required for recreation and public purpose uses. Examples of uses made of R&PP lands are parks and greenbelts, sanitary landfills, schools, religious facilities, and camps for youth groups. The act provides substantial cost benefits for land acquisition and provides for recreation facilities or historical monuments at no cost.

**RECREATION VISITOR DAY.** An aggregation of 12 visitor hours. A visitor hour is the presence of one or more persons on land and water for outdoor recreation for periods totaling 60 minutes; for example, one person for one hour, two persons for one-half hour each, and so on.

**REGENERATION.** The renewal of a tree crop by natural or artificial means. Also, the young crop itself.

**REHABILITATION.** Restoration of partially or totally lost biological productive capability.

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**RIGHT-OF-WAY.** The legal right of use, occupancy, or access across land or water areas for a specified purpose or purposes. Also, the lands covered by such legal rights.

**RIP.** To break up compacted soil, as in an area where trucks and heavy equipment have been operated, with a toothed implement. The purpose of ripping is to improve growing conditions in areas to be reclaimed.

**RIPRAP.** A foundation or sustaining wall of rock on a stream bank or sloping road cut, used to prevent water erosion.

**RIPARIAN COMMUNITIES.** Communities of vegetation associated with either open water or water close to the surface. Examples are meadows, aspen, and other trees and shrubs associated with water.

**ROADED NATURAL RECREATION OPPORTUNITY.** Opportunity for both motorized and nonmotorized forms of recreation in areas where either affiliation with user groups or isolation from sights and sounds of human beings are possible. Opportunity for a high degree of interaction with the natural environment where outdoor skills may be important.

**SALABLE MINERALS.** Minerals that may be sold under the Material Sale Act of 1947, as amended. Included are sand, gravel, flagstone, scoria, and crushed rock such as limestone.

**SAWTIMBER.** Trees that have reached sufficient size and maturity to be used for "dimension lumber" such as 2 x 4s.

**SCARIFICATION.** Disturbance of the upper soil layer by mechanical means in preparation of a site for seeding.

**SCOPING.** A process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. The process involves participation of affected federal, state, and local agencies, affected Indian tribes, and other interested persons, as well as the general public. As part of the scoping process, one or more public meetings are held early in the process of document preparation.

**SEASON OF USE.** The time during which livestock grazing is permitted on a given range area, as specified in the grazing lease.

**SEMPRIMITIVE MOTORIZED RECREATION OPPORTUNITY.** Opportunity to use motorized equipment in areas with some opportunity for isolation from the sights and sounds of human beings. Isolation is not as important in semiprimitive opportunities as it is in primitive opportunities. Opportunity for a high degree of interaction with the natural environment, moderate challenge and risk, and use of outdoor skills.

**SEMPRIMITIVE NONMOTORIZED RECREATION OPPORTUNITY.** Opportunity for recreation without motorized equipment in areas with some opportunity for isolation from the sights and sounds of human beings. Isolation is not as important in semiprimitive opportunities as it is in primitive opportunities. Opportunity for a high degree of interaction with the natural environment, moderate challenge and risk, and use of outdoor skills.

**SHOT HOLE.** One method of generating a seismic impulse in exploring for oil and gas. An explosive charge detonated in a drill hole creates shock waves that travel through or are reflected from various rock layers and are then recorded by sensors. The time required for the shock wave to travel through the rock formation yields useful information on the possible presence of oil and gas.

**SLOPE.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by the horizontal distance, then multiplied by 100. A slope of 20% is a drop of 20 feet in 100 feet of horizontal distance.

**SOIL COMPACTION.** Increasing the bulk density of soil through the compression of large voids. Reduction of the air spaces in soil can result in overland flow of water and in surface erosion. It also can significantly reduce plant vigor in the root zone.

**SOIL PRODUCTIVITY.** The capability of a soil to produce a specified plant or sequence of plants under a specified system of management.

**SPLIT ESTATE.** Surface and minerals of a given area in different ownerships. Frequently the surface will be privately owned and the minerals federally owned.

**STIPULATION.** A condition or requirement attached to a lease or contract, usually dealing with protection of the environment or recovery of a mineral.

**STOCKING RATE.** The number of animals on a specified area at a given time. Usually expressed in acres per AUM.

**STRATEGIC MINERALS.** Minerals essential to the national defense for the supply of which, during war, the nation depends wholly or in part on sources outside the United States. Strict measures controlling conservation and distribution of strategic minerals are necessary. Strategic minerals in 1941 included aluminum, chromium, manganese, and quartz crystal.

**STRUTTING GROUND.** An area used by sage grouse in early spring for elaborate, ritualized courtship displays. Also see *Lek*.

**SURFACE DISTURBANCE.** Disturbance of the vegetative or soil surface by any action. "No surface disturbance" restrictions apply to all activities but casual use and emergency situations such as fire suppression.

**SURFACE OCCUPANCY.** Placement or construction on the land surface of semipermanent or permanent facilities requiring continual service or maintenance. Casual use is not included.

**SURFACE WATER.** All waters on the land surface, such as lakes, ponds, reservoirs, rivers, and streams.

**SUSPENDED SOLIDS.** Solids that remain in suspension in water for a considerable period of time without contact with the bottom.

**SUSTAINED YIELD.** The achievement and maintenance in perpetuity of a high level annual or regular periodic output of the various renewable resources of the public lands consistent with multiple use. It applies to the management of all renewable resources, including forage, wildlife, water, recreation, and any value that can be managed for renewal and sustained productivity.

**THREATENED SPECIES.** Any plant or animal species that is likely to become an endangered species throughout all or a significant portion of its range, as defined by the U.S. Fish and Wildlife Service under the authority of the Endangered Species Act of 1973.

**TIMBER MANAGEMENT PLAN.** A detailed activity plan designed to implement long-range forest management goals in a specific area. Such plans include timber harvest, preliminary road reconnaissance, and forest development practices.

**TIMBER PRODUCTION BASE.** Acreage included in the calculation of the allowable cut.

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**TOTAL DISSOLVED SOLIDS.** A measure of the mineral and organic material dissolved in water. It is usually determined by evaporating a filtered volume of water and weighing the residue. The amount of residue is expressed as a proportion of the original sample in parts per million or milligrams per liter (mg/l).

**TOTAL SUSPENDED PARTICULATES.** All solid or semisolid material found in the atmosphere.

**UNSUITABILITY CRITERIA.** Criteria of the federal coal management program by which lands may be assessed unsuitable for all or certain stipulated methods of coal mining.

**UNSUITABLE RANGE.** An area not suited for livestock grazing because it is barren, lacks forage or water, has unstable soils, or contains physical barriers such as rugged topography, rock, or dense timber. Such an area may still have value for wildlife.

**VALUE-AT-RISK CLASSES.** A classification system to indicate the value of the resources that could be damaged or benefited by fire. Areas are analyzed by specialists in various resource disciplines; each discipline assigns a number, then the numbers are totaled. A value class is then determined on the basis of the numbers assigned. Value class 1 is the lowest and 5 is the highest. Class 5 areas generally have a combination of high resource values (water, soil, air, recreation, grazing, timber, and wildlife).

**VEGETATION TYPE.** A plant community with visually distinguishable characteristics, named for the apparent dominant species.

**VISUAL RESOURCES.** Visible features of the landscape including land, water, vegetation, animals, and other features that make up the scenery of an area.

**VISUAL RESOURCE MANAGEMENT.** The system by which the BLM classifies and manages scenic values and visual quality of public lands. The system is based on research that has produced ways of assessing aesthetic qualities of the landscape in objective terms. After inventory and evaluation, lands are given relative visual ratings (management classes), which determine the amount of modification allowed to the basic elements of the landscape.

**VISUAL RESOURCE MANAGEMENT CLASSES.** There are five VRM classes.

**Class I:** Very limited management activity is allowed. Created contrasts must not attract attention. This classification applies to wilderness areas, wild and scenic rivers, primitive areas, some natural areas, and similar sites where landscape modification activities should be restricted.

**Class II:** Changes in any of the basic elements caused by management activity should not be evident in the characteristic landscape. Contrasts are seen but must not attract attention.

**Class III:** Changes in the basic elements caused by a management activity may be evident but should remain subordinate to the visual strength of the existing landscape.

**Class IV:** Any contrast attracts attention and is a dominant feature of the landscape in terms of scale, but it

should repeat the form, line, color, and texture of the characteristic landscape.

**Class V:** The Class V classification is applied to areas where the natural character of the landscape has been disturbed to a point where rehabilitation is needed to bring it up to one of the four other classifications. The classification also applies to areas where there is potential to increase the landscape's visual quality. It is often used as an interim classification until objectives of another class can be reached.

Scenic quality classes are defined by a system that rates seven key factors: landform, vegetation, water, color, influence of adjacent scenery, scarcity, and cultural modification. There are three scenic quality classes.

**Class A** areas are those that combine the most outstanding characteristics of each rating factor.

**Class B** areas are areas in which there is a combination of some outstanding features and some that are fairly common to the physiographic region.

**Class C** areas are those in which the features are fairly common to the physiographic region.

**WATERSHED.** A total area of land above a given point on a waterway that contributes runoff water to the flow at that point. **Sensitive watershed** is an area with fragile geologic, soil, or vegetative conditions, where small changes in the intensity of land use can cause large changes in erosion rates.

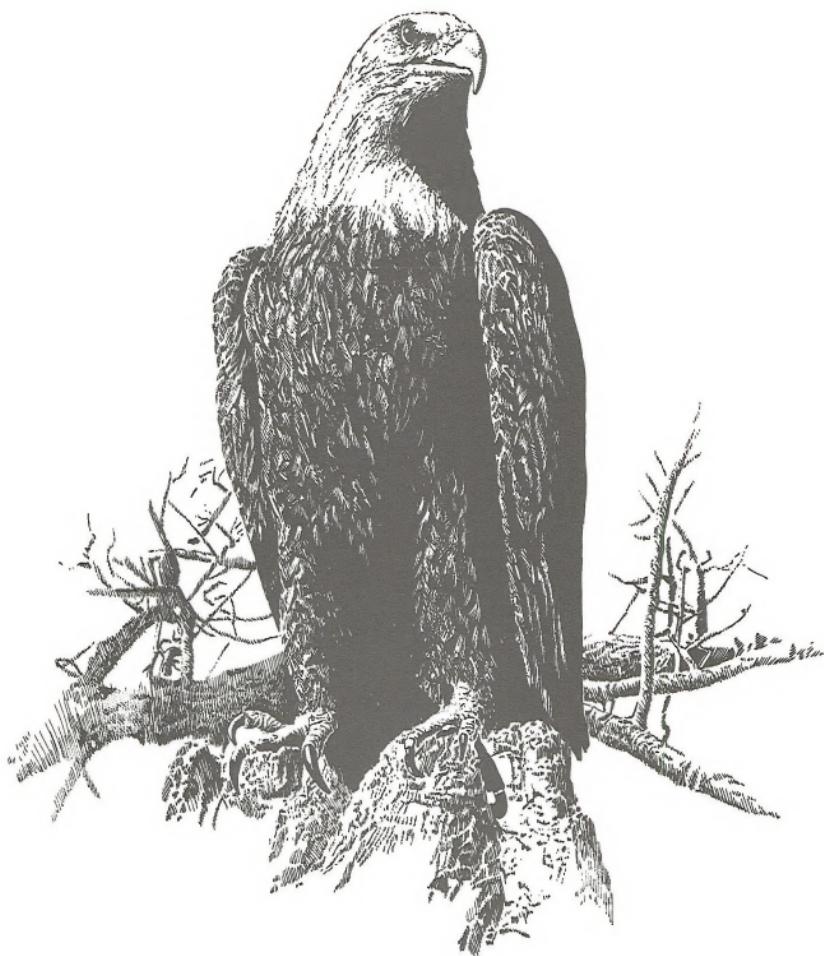
**WETLANDS.** Permanently wet or intermittently flooded areas where the water table (fresh, saline, or brackish) is at, near, or above the soil surface for extended intervals, where hydric wet soil conditions are normally exhibited, and where water depths generally do not exceed two meters.

**WILDERNESS AREA.** An area formally designated by Congress as a part of the National Wilderness Preservation System. Also see appendix 7 of this document.

**WILDERNESS STUDY AREA.** A parcel of public land that has been found to possess the basic wilderness characteristics identified by Congress in the Wilderness Act of 1964; namely, naturalness, outstanding opportunities for solitude or a primitive and unconfined type of recreation, size of at least 5,000 acres, and the appearance of having been affected primarily by the forces of nature. Supplemental values such as geological, archeological, historical, ecological, or scenic features also may be present. Also see appendix 7.

**WITHDRAWAL.** An action that restricts the use of described public lands from operation of certain laws, which are also described in the withdrawal order. Withdrawal also may be used to transfer jurisdiction or management to other federal agencies.

**WOODLANDS.** Forestlands not capable of producing more than 20 cubic feet of wood fiber per acre per year. Also, forestlands that are considered productive and capable of producing more than 20 cubic feet per acre per year but that have not met certain economic, environmental, or multiple use criteria for inclusion in the allowable cut base for industrial sawtimber but have not been specifically excluded from timber harvest activities.



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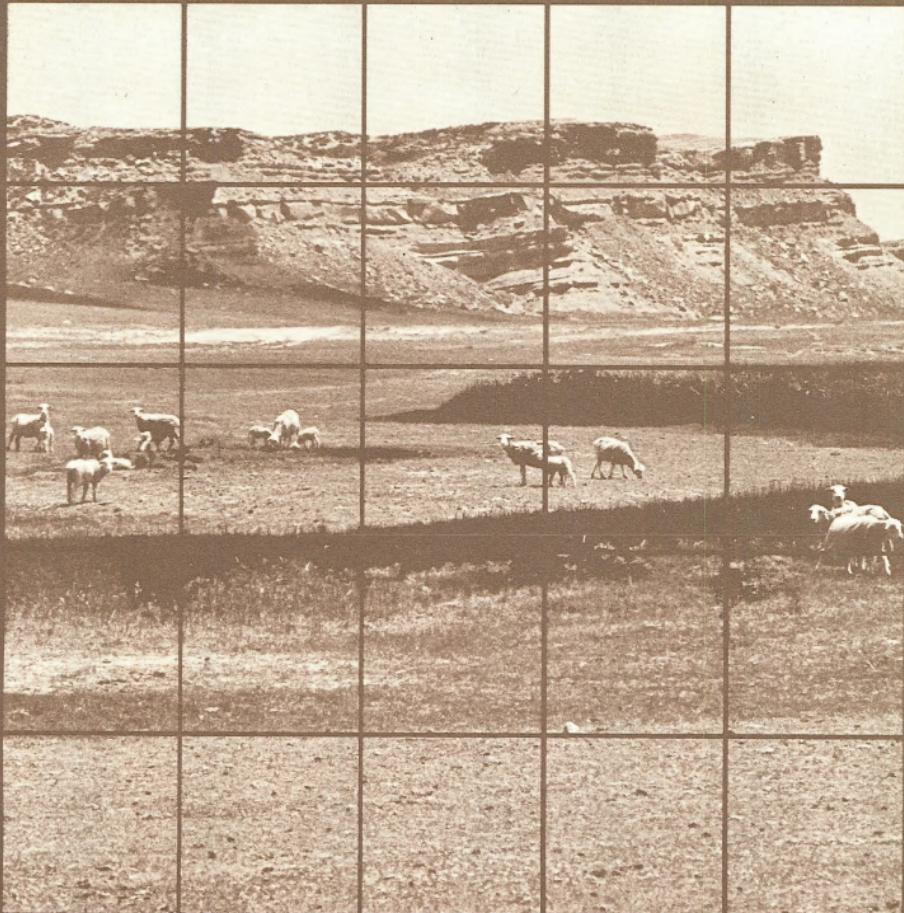
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